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New York Bight Final Programmatic Environmental Impact Statement

October 2024

Volume II: Appendices A-P

BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

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Appendix A: Consultation and Coordination

A.1 Introduction

This appendix discusses public, agency, and tribal involvement leading up to the preparation and publication of the New York Bight (NY Bight) Final Programmatic Environmental Impact Statement (PEIS), including formal consultations, cooperating and participating agency and Cooperating Tribal Government exchanges, the public scoping comment period, and other correspondence. Interagency consultation, coordination, and correspondence throughout the development of the Final PEIS occurred primarily through virtual meetings, teleconferences, and written communications (including email).

A.2 Consultations

A.2.1 Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended (16 United States Code [U.S.C.] 1531 et seq.), requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency could affect a protected species or its critical habitat, that agency is required to consult with either the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS), depending upon the jurisdiction of the services. Pursuant to 50 Code of Federal Regulations (CFR) 402.07, the Bureau of Ocean Energy Management (BOEM) has accepted designation as the lead federal agency for the purposes of fulfilling interagency consultation under Section 7 of the ESA for listed species. On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation.

A.2.2 Tribal Consultation

Executive Order 13175 commits federal agencies to engage in government-to-government consultation with Tribal Nations when federal actions have tribal implications. A June 29, 2018, memorandum outlines BOEM's current tribal consultation policy (BOEM 2018). This memorandum states that "consultation is a deliberative process that aims to create effective collaboration and informed federal decision-making" and is in keeping with the spirit and intent of Executive Order 13175 (BOEM 2018). BOEM implements tribal consultation policies through formal government-to-government consultation, informal dialogue, collaboration, and other engagement.

On November 30, 2022, in conjunction with a White House Tribal Summit held at the Department of the Interior, the Biden-Harris administration issued several directives and updates on Tribal policies including: Presidential Memorandum on Uniform Standards for Tribal Consultation (November 30, 2022); Department of the Interior Policy on Consultation with Indian Tribes (November 30, 2022); Department of the Interior Procedures for Consulting with Indian Tribes (November 30, 2022);

Department of the Interior Policy on Consultation with Alaska Native Claims Settlement Act Corporations (November 30, 2022); Department of the Interior Procedures for Consultation with Alaska Native Claims Settlement Act Corporations (November 30, 2022); Best Practices for Identifying and Protecting Tribal Treaty Rights, Reserved Rights and Other Similar Rights in Federal Regulatory Actions and Federal Decision-Making (Draft September 2022); Guidance for Federal Departments and Agencies on Indigenous Knowledge (November 30, 2022); Memorandum on Implementation of Guidance for Federal Departments and Agencies on Indigenous Knowledge (November 30, 2022); Collaborative and Cooperative Stewardship with Tribes and the Native Hawaiian Community Chapter 1: Policy and Responsibilities (November 30, 2022); and Collaborative and Cooperative Stewardship with Tribes and the Native Hawaiian Community Chapter 2: Committee on Collaborative and Cooperative Stewardship (November 30, 2022). Finally, on April 21, 2023, President Biden issued Executive Order 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All, which includes coverage for Tribal Nations.[1]

On July 7, 2022, BOEM informed tribal leaders via email of the purpose of and anticipated publication date for the Notice of Intent (NOI) to prepare a PEIS for the six NY Bight lease areas. On July 15, 2022, BOEM sent individual letters via email to tribal leaders with the Absentee-Shawnee Tribe of Indians of Oklahoma, The Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Mashpee Wampanoag Tribe, Mashantucket (Western) Pequot Tribal Nation, Mohegan Tribe of Connecticut, Shawnee Tribe, Stockbridge-Munsee Community Band of Mohican Indians, The Narragansett Indian Tribe, The Shinnecock Indian Nation, and the Wampanoag Tribe of Gay Head (Aquinnah). These letters notified them that the NOI to prepare a PEIS for the NY Bight lease areas was issued that day and noted that the scoping comment period was open until August 15, 2022. Additionally, the letters initiated formal consultation with twelve Tribes under the National Historic Preservation Act (NHPA) and invited them to be NHPA Section 106 consulting parties and Cooperating Tribal Governments for the PEIS. One tribal leader initially responded that they would not like to participate in discussions related to the NY Bight PEIS: the Mashantucket (Western) Pequot Tribal Nation. As of April 19, 2023, Michael Kickingbear Johnson, Mashantucket Pequot (Western) Tribal Historic Preservation Officer (THPO) informed BOEM that the Mashantucket (Western) Pequot Tribal Nation, "are again revising [their] areas of interest by expanding them." BOEM has established a Cooperating Tribal Government relationship with the Tribe and has added them to the NHPA Consultation list. The Stockbridge-Munsee Community Band of Mohican Indians have also agreed to be a Cooperating Tribal Government on the NY Bight PEIS.

On September 21, 2022, a virtual meeting was held with Delaware Tribe of Indians, Stockbridge-Munsee Community Band of Mohican Indians, and Shinnecock Indian Nation distinguishing the NY Bight, Empire Wind, and Atlantic Shores lease areas. During that meeting, they requested a geophysical map, location(s) of trenches for transmission lines, key observation points (KOPs), as well as information on radiant heat from cables, how turbines may affect surface ocean temperatures, and how build out may

[1] Executive Order 14096 further embeds "environmental justice agenda into the work of federal agencies to achieve real, measurable progress that communities can count on." This executive order and subsequent guidance has been incorporated into the Final PEIS.

affect migration patterns of keystone species, marine mammals, and ESA-listed species. A draft list of KOPs for the NY Bight lease areas was shared with all Section 106 consulting parties, which includes all invited Tribal Nations who did not decline the invitation to consult. Information regarding transmission lines for the NY Bight lease areas is currently unknown and will be shared at the project-specific stage.

Additionally, the following Tribes were invited to participate in quarterly Environmental Justice Forums, beginning in October 2022: the Mashpee Wampanoag, Aquinnah Wampanoag, Mohegan, Stockbridge-Munsee Community Band of Mohican Indians, Delaware Tribe of Indians, The Delaware Nation, The Narragansett Indian Tribe, Shinnecock Indian Nation, Shawnee Nation, Eastern Shawnee Tribe of Oklahoma, and Absentee-Shawnee Tribe of Indians of Oklahoma. Impacts from noise on marine mammals was discussed during the Environmental Justice Forums, and supporting resources were also shared with participants. See Section 3.6.4.1.6, *Environmental Justice Engagement,* for more information on the Environmental Justice Forums.

On November 2, 2022, the NY Bight PEIS was discussed on the Atlantic Quarterly meeting tribal call with BOEM Director Amanda Lefton. On January 10, 2023, BOEM held a virtual meeting to share the location of the NY Bight lease areas including a map of the bathymetry, areas of cultural significance for consideration as KOPs, a field opportunity to Block Island, Native American history, and their connection to the shipwrecks. The following representatives attended: Carissa Speck, Delaware Nation Historic Preservation Director; Katelyn Lucas, Delaware Nation Historic Preservation Assistant; Jeff Bendremer, Registered Professional Archaeologist, Stockbridge-Munsee THPO; Susan Bachor, Delaware Tribe THPO and Archaeologist; Kevin Devine, Aquinnah Wampanoag Tribal Council; Jeremy Dennis, Shinnecock Indian Nation Assistant THPO; Kelly Dennis, Shinnecock Council of Trustees Secretary (and Secretary's Tribal Advisory Committee member); and Kelsey Leonard, Shinnecock Tribal Member (and Committee on Offshore Science and Assessment member). On April 27, 2023, Erin Paden, Shawnee Tribe THPO asked to be taken off all NY Bight related correspondence. Several Tribes requested staff level government-to-government meetings with BOEM to discuss the NY Bight PEIS. BOEM met with the Stockbridge-Munsee Community Band of Mohican Indians on January 29, 2024, The Delaware Nation on February 26, 2024, and the Mashantucket (Western) Pequot Tribal Nation on February 29, 2024. As of August 2024, no Tribes have requested formal government-to-government consultation on the NY Bight PEIS.

A.2.3 National Historic Preservation Act

Section 106 of the NHPA (54 U.S.C. 306108) and its implementing regulations (36 CFR part 800) require federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. In anticipation of the project-level review of Construction and Operations Plans (COPs) for each of the NY Bight lease areas, BOEM has identified an opportunity to engage the appropriate federally recognized Tribes, State Historic Preservation Offices (SHPO) and consulting parties to develop a Programmatic Agreement that outlines the project-level review process; identifies avoidance, minimization, mitigation, and monitoring (AMMM) measures; and provides templates for key documents that may be required in the course of project-level Section 106 consultation. Appendix I, *NHPA Section 106 Summary*, of the Final PEIS contains a summary of BOEM's Section 106 programmatic review, including a description and summary of BOEM's consultation so far.

On July 15, 2022, BOEM contacted representatives of other federal agencies, federally recognized Tribes, state and local governments, preservation organizations, lessees of the six NY Bight lease areas and other potentially interested parties to determine their interest in participating in the programmatic Section 106 review as consulting parties. Invitations were extended to additional organizations as they were identified. Those parties that have confirmed their desire to participate in the programmatic Section 106 review of the NY Bight as of May 27, 2024, are listed in Table A1.

BOEM conducted Section 106 early coordination meetings with ACHP on September 7, 2022, and with the New Jersey and New York SHPOs and ACHP on September 21, 2022, and January 10, 2023. BOEM conducted a Section 106 consultation meeting with consulting parties on March 13, 2023 to introduce the objectives for the NY Bight programmatic Section 106 review and solicit input on the development of the Programmatic Agreement. BOEM conducted a second Section 106 consultation meeting on August 3, 2023 to present an introduction to BOEM's analysis of impacts on scenic and visual resources including a preview of the development of photo simulations of development scenarios for the NY Bight lease areas and to provide an overview of BOEM's progress on the development of the Programmatic Agreement. BOEM conducted a third Section 106 consultation meeting on February 15, 2024, to present the responses to consulting party comments and the revised Programmatic Agreement. A fourth Section 106 consultation meeting was held on June 20, 2024, to present the third version of the Programmatic Agreement and discuss responses to consulting party comments.

In the course of consultation activities, BOEM has identified additional organizations or agencies that may have an interest in the effects of offshore wind development on cultural resources and has continued to invite such parties to participate in the programmatic Section 106 review. BOEM will continue consulting with federally recognized Tribes, New Jersey SHPO, New York SHPO, ACHP, and other consulting parties regarding the project-level review procedures and the development of programmatic AMMM measures that could be adopted at the COP stage to resolve adverse effects on historic properties.

Table A1. Participating consulting parties for the NY Bight Programmatic Agreement

Organization Type	Participating Consulting Parties
Federal Government	U.S. Advisory Council on Historic Preservation
Federal Government	U.S. Army Corps of Engineers
Federal Government	U.S. Bureau of Safety and Environmental Enforcement
Federal Government	U.S. Department of the Navy
Federal Government	U.S. Environmental Protection Agency
Federal Government	U.S. National Park Service
Federally Recognized Tribe	Absentee-Shawnee Tribe of Indians of Oklahoma
Federally Recognized Tribe	Delaware Tribe of Indians
Federally Recognized Tribe	Eastern Shawnee Tribe of Oklahoma
Federally Recognized Tribe	Mashantucket (Western) Pequot Tribal Nation
Federally Recognized Tribe	Mashpee Wampanoag Tribe

Organization Type	Participating Consulting Parties
Federally Recognized Tribe	Mohegan Tribe of Connecticut
Federally Recognized Tribe	Stockbridge-Munsee Community Band of Mohican Indians
Federally Recognized Tribe	The Delaware Nation
Federally Recognized Tribe	The Narragansett Indian Tribe
Federally Recognized Tribe	The Shinnecock Indian Nation
Federally Recognized Tribe	Tuscarora Nation
Federally Recognized Tribe	Wampanoag Tribe of Gay Head (Aquinnah)
Lessee	Atlantic Shores Offshore Wind Bight (OCS-A 0541)
Lessee	Attentive Energy (OCS-A 0538)
Lessee	Bluepoint Wind (OCS-A 0537)
Lessee	Community Offshore Wind (OCS-A 0539)
Lessee	Invenergy (OCS-A 0542)
Lessee	Vineyard Mid-Atlantic Offshore Wind (OCS-A 0544)
Local Government	Atlantic County
Local Government	Avon-by-the-Sea Borough
Local Government	Borough of Beach Haven
Local Government	Borough of Highlands
Local Government	Borough of Point Pleasant Beach
Local Government	Borough of Sea Bright
Local Government	Borough of Seaside Park
Local Government	Borough of Spring Lake
Local Government	Cape May County
Local Government	City of Absecon
Local Government	City of Asbury Park
Local Government	City of Hoboken
Local Government	City of North Wildwood
Local Government	Monmouth County
Local Government	Monmouth County Park System
Local Government	Nassau County
Local Government	Neptune City
Local Government	Suffolk County
Local Government	Town of Babylon
Local Government	Town of Islip
Local Government	Town of Oyster Bay
Local Government	Township of Brick
Local Government	Township of Hamilton
Local Government	Township of Middletown
Local Government	Township of Stafford
Local Government	Village of Bellport
Local Government	Village of Patchogue
Other Potentially Interested Parties	Green-Wood Cemetery
Other Potentially Interested Parties	Hempstead Harbor Protection Committee

Organization Type	Participating Consulting Parties
Other Potentially Interested Parties	Point O'Woods Association
Preservation Organization	Bay Shore Historical Society
Preservation Organization	Greater Cape May Historical Society
Preservation Organization	Historic Districts Council
Preservation Organization	Historical Society of Highlands
Preservation Organization	Ocean City Historical Museum
Preservation Organization	Preservation Alliance of Spring Lake
Preservation Organization	Romer Shoal Light
Preservation Organization	Save Long Island Beach Inc.
Preservation Organization	The Noyes Museum of Art
Preservation Organization	West Bank Lighthouse
State Government	New Jersey State Museum
State Government	New York State Parks, Recreation & Historic Preservation, Long Island State Parks Region 9
State Government	New York State Parks, Recreation and Historic Preservation
State Government (SHPO)	New Jersey Department of Environmental Protection, Historic Preservation Office
State Government (SHPO)	New York State Historic Preservation Office
State Recognized Tribe	Lenape Indian Tribe of Delaware

A.2.4 Magnuson-Stevens Fishery Conservation and Management Act

Pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), federal agencies are required to consult with NMFS on any action that may result in adverse effects on Essential Fish Habitat (EFH). NMFS regulations implementing the EFH provisions of the MSA can be found at 50 CFR part 600. As provided for in 50 CFR 600.920(b), BOEM has accepted designation as the lead agency for the purposes of fulfilling EFH consultation obligations under Section 305(b) of the MSA. Certain Outer Continental Shelf (OCS) activities authorized by BOEM may result in adverse effects on EFH and, therefore, require consultation with NMFS. At this programmatic stage, an EFH Assessment and consultation are not being undertaken. Project-specific EFH Assessments will be prepared for each offshore wind project during the COP-specific NEPA process.

A.3 Development of Final Environmental Impact Statement

This section provides an overview of the development of the Final PEIS, including public scoping, cooperating agency involvement, and distribution of the Draft PEIS for public review and comment.

A.3.1 Scoping

On July 15, 2022, BOEM issued a NOI to prepare a PEIS consistent with National Environmental Policy Act (NEPA) regulations (42 U.S.C. 4321 et seq.) to assess the potential impacts of the Proposed Action and alternatives [87 *Federal Register* 42495]. The NOI commenced a public scoping process for identifying issues and potential alternatives for consideration in the PEIS. The formal scoping period was from July 15, 2022, through August 15, 2022, but was extended until August 30, 2022. BOEM held three virtual public scoping meetings on July 28, 2022, August 2, 2022, and August 4, 2022, to share information, solicit feedback, and to answer questions. Throughout the scoping period, federal agencies, Tribal Nations, and state and local governments, and the general public had the opportunity to help BOEM identify potentially significant resources and issues, impact-producing factors (IPFs), reasonable alternatives, and potential mitigation measures to analyze in the PEIS, as well as provide additional information. BOEM also used the NEPA scoping process to initiate the Section 106 consultation process under the NHPA (54 U.S.C. 300101 et seq.), as permitted by 36 CFR 800.2(d)(3), which requires federal agencies to assess the effects of projects on historic properties. The NOI requested comments from the public in written form, delivered by hand or by mail, or through the regulations.gov web portal.

BOEM received a total of 43 comments during the scoping period. BOEM reviewed and considered all scoping comments in the development of the Draft PEIS. A scoping summary report summarizing the submissions received and the methods for analyzing them is available in Appendix O, *Scoping Report*, of the PEIS. In addition, all public scoping comments received can be viewed online at http://www.regulations.gov by typing "BOEM-2022-0034" in the search field. As detailed in the scoping summary report, the resource areas or NEPA topics most referenced in the scoping comments were the Purpose and Need, the Proposed Action, Public Engagement, Commercial Fisheries and For-Hire Recreational Fishing, Marine Mammals, Navigation and Vessel Traffic, and Scenic and Visual Resources.

A.3.2 Cooperating and Participating Agencies and Cooperating Tribal Governments

BOEM invited other federal agencies, Tribal Nations, and state and local governments to consider becoming cooperating agencies in the preparation of the PEIS. According to Council of Environmental Quality (CEQ) guidelines, qualified agencies and governments are those with "jurisdiction by law or special expertise" (CEQ 1981). BOEM also invited agencies that do not have jurisdiction by law or special expertise but that have a vested interest in the PEIS to engage as participating agencies. Agreeing to engage as a cooperating or participating agency allowed agencies the opportunity to participate in discussions and contribute to the development of the PEIS.

BOEM held interagency meetings with cooperating and participating agencies on September 12, 2022, December 2, 2022, August 7, 2023, and June 27, 2024, to discuss the environmental review process, schedule, responsibilities, consultation, potential alternatives, and the changes from Draft to Final following the public comment period. BOEM also met individually and in small groups with cooperating and participating agencies who requested additional discussion on the PEIS at various times throughout development of the PEIS.

The following federal agencies, Tribal Nations, and state and local governments have supported preparation of the Draft PEIS as cooperating and participating agencies and Cooperating Tribal Governments:

Cooperating Agencies

- Bureau of Safety and Environmental Enforcement
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- New Jersey Department of Environmental Protection
- National Park Service
- New Bedford Port Authority
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- New York State Department of State
- Massachusetts Office of Coastal Zone Management
- New York State Department of Environmental Conservation
- New Jersey Board of Public Utilities

Cooperating Tribal Governments

- Mashantucket (Western) Pequot Tribal Nation
- Stockbridge-Munsee Community, Band of Mohican Indians

Participating Agencies

- New York City Mayor's Office of Environmental Coordination

A.3.3 Distribution of the Draft Programmatic Environmental Impact Statement for Review and Comment

On January 12, 2024, BOEM published a Notice of Availability (NOA) for the Draft PEIS. The Draft PEIS was made available in electronic format for public viewing at https://www.boem.gov/renewable-energy/state-activities/new-york-bight. Notification was provided as indicated in Appendix N, *Distribution List,* and hard copies of the Draft PEIS were delivered to entities as requested. Publication of the Draft PEIS initiated a 45-day comment period. On February 29, 2024, BOEM announced an extension to the comment period, which concluded on March 13, 2024. BOEM held five public meetings to solicit feedback and identify issues for consideration in preparing the Final PEIS. Three in-person meetings were held in North Dartmouth, Massachusetts; Stony Brook, New York; and Toms River, New Jersey on February 5, 7, and 8, 2024, respectively. Two virtual meetings were held on January 31 and February 13, 2024. Throughout the public review period, government agencies, members of the public, and interested stakeholders had the opportunity to provide comments on the Draft PEIS in any of the following ways:

- In hard copy form, delivered by mail, enclosed in an envelope labeled "NY BIGHT PEIS" and addressed to Chief, Division of Environmental Assessment, Office of Environmental Programs, Bureau of Ocean Energy Management, 45600 Woodland Road (VAM-OEP), Sterling, Virginia 20166.
- Through the regulations.gov web portal by navigating to https://www.regulations.gov/ and searching for docket number "BOEM-2024-0001."
- By attending one of the public meetings on the dates listed in the NOA and providing written or verbal comments.

BOEM reviewed and considered all 1,568 comments in the development of the Final PEIS. BOEM's evaluation of public submissions focused on those comments within the submissions that were identified as substantive. Final PEIS Appendix P, *Responses to Comments on the Draft Programmatic Environmental Impact Statement*, describes the public comment processing methodology and includes comment responses. All public comment submissions received on the Draft PEIS can be viewed online at https://www.regulations.gov/ by typing "BOEM-2024-0001" in the search field.

A.3.4 Distribution of the Final Environmental Impact Statement

The Final PEIS is available in electronic format for public viewing at https://www.boem.gov/renewable-energy/state-activities/new-york-bight. Hard copies and digital copies of the Final PEIS can be requested by contacting BOEM, Office of Environmental Programs in Sterling, Virginia, at (703) 787-1703. Publication of the Final PEIS initiates a minimum 30-day mandatory waiting period, during which BOEM is required to pause before issuing a Record of Decision (ROD). Notification will be provided as indicated in Appendix N, *Distribution List,* of the Final PEIS.

A.4 References Cited

[BOEM] Bureau of Ocean Energy Management. 2018. Tribal consultation guidance. 2023 Jun 29. US Department of the Interior, Bureau of Ocean Energy Management. https://www.boem.gov/sites/default/files/about-boem/Public-Engagement/Tribal-Communities/BOEM-Tribal-Consultation-Guidance-with-Memo.pdf.

[CEQ] Council on Environmental Quality. 1981. Memorandum to agencies: Forty most asked questions concerning CEQ's National Environmental Policy Act regulation. Amended 1986. Washington (DC): Council on Environmental Quality. Report No.: 46 Fed. Reg. 18026. https://www.energy.gov/sites/prod/files/2018/06/f53/G-CEQ-40Questions.pdf.

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Appendix B: Supplemental Information and Additional Figures and Tables

B.1 Climate and Meteorology

Conditions that affect the weather and climate in an area include wind speed and direction, air temperature, and precipitation. Long-term averages of these conditions produce the regional climate. Extreme meteorological conditions are produced in the Mid-Atlantic region of the United States during tropical and extra-tropical storms. Over the open ocean, meteorological characteristics are fundamentally influenced by oceanographic conditions and are therefore sometimes jointly discussed as "metocean" conditions. In temperate regions such as the Mid-Atlantic, several metocean conditions are highly seasonal and driven by both atmospheric and oceanic circulation patterns. Daily variability in meteorological conditions will drive fluctuations in wind farm power production and associated stresses on the wind turbine generators (WTGs), while long-term performance may be estimated based on the climatic conditions.

B.1.1 Regional Climate Overview

The Atlantic seaboard is classified as a mid-latitude climate zone based on the Köppen Climate Classification System. This larger region, which encompasses the Mid-Atlantic region, is characterized by mostly moist subtropical conditions, generally warm and humid in the summer with relatively mild winters (BOEM 2021a). Prevailing winds at the middle latitudes over North America occur mostly west to east ("westerlies") and contribute to seasonal variability along the Atlantic seaboard (NJDEP 2010).

The New York Bight (NY Bight) region is an offshore area existing within the larger Mid-Atlantic region and extending generally northeast from Cape May in New Jersey to Montauk Point on the eastern tip of Long Island, New York (BOEM 2021b). However, the lease areas identified for the Programmatic Environmental Impact Statement (PEIS) extend generally northeast from Atlantic City, New Jersey, to the southern end of Long Island, New York (BOEM 2021b). Thus, the NY Bight lease areas span only part of the full NY Bight region and include areas offshore of the states of New Jersey and New York.

The six NY Bight lease areas identified in the PEIS, listed from north to south, include Lease Areas OCS-A-0544, -0537, -0538, -0539, -0541, and -0542. The northernmost NY Bight lease area, OCS-A-0544, is adjacent to the Empire Wind lease area, which is identified as OCS-A-0512. Similarly, the southernmost NY Bight Lease Areas OCS-A-0541 and OCS-A-0542 are approximately 30 miles northeast of the Ocean Wind 1 lease area, which is identified as OCS-A-0498. As such, climatic conditions reported for the Empire Wind lease area (OCS-A-0512) are representative of the northern portion of the six NY Bight lease areas, and climatic conditions reported for the Ocean Wind 1 lease area (OCS-A-0498) are representative of the southern portion of the six NY Bight lease areas. Together, the climatic conditions of the Empire Wind and Ocean Wind 1 lease areas are representative of the climatic conditions in the six NY Bight lease areas (referred to hereafter as NY Bight lease areas).

Consistent with the larger Mid-Atlantic region, the climate across New York State can be described as humid and continental (New York State Climate Action Council 2010). The climate across New Jersey State varies, with greater humidity near the coastal and southern part of the state than in the inland and northern regions (NJDEP 2010). The NY Bight region along the New York and New Jersey coasts experiences four distinct seasons with cold air temperatures during the winter months. Coastal areas along the NY Bight are especially prone to coastal storms and their associated effects, including heavy precipitation, high winds, and coastal flooding (New York State Climate Action Council 2010). Coastal storms are common in the vicinity of the NY Bight lease areas and include hurricanes and tropical storms during the warmer months (July to September), and northeasters or "nor'easters" (extratropical storms in which the winds in coastal areas blow from the northeast) during the cooler months (October to April). Extreme rainfall and flooding associated with storm events contribute to erosion of coastal wetland areas and inland areas adjacent to the shoreline (NJDEP 2010; New York State Climate Action Council 2010).

The North Atlantic Oscillation (NAO) also affects climate in the Northwest Atlantic on the scale of decades (NJDEP 2010; Townsend et al. 2004). The NAO is calculated as the wintertime pressure difference between the high-pressure system over the Azores Islands and the low-pressure system over Iceland (NJDEP 2010; Townsend et al. 2004). Shifts in the ratio of these pressures contribute to warmer or cooler average winters in the Northwest Atlantic, which through icing, fog, and other weather events can affect offshore construction and operational conditions for wind energy development. Since the late 1970s, warmer NAO conditions have persisted on average (NJDEP 2010; Townsend et al. 2004). The NAO may be influenced by the El Niño-Southern Oscillation, which is a large-scale, multi-year fluctuation in sea surface temperatures, referred to as sea surface temperature anomalies, in the Pacific Ocean (NJDEP 2010). The NAO may also be correlated with an 11-year solar cycle (IPCC 2021).[1]

The United States Northeast region is currently subject to climate changes associated with global warming that are primarily attributed to human activities, especially the production of heat-trapping gases (i.e., greenhouse gases [GHG]) (Dupigny-Giroux et al. 2018; Hayhoe et al. 2018; IPCC 2021). These regional changes include an average winter-spring increase in air temperature of 1.67 degrees Fahrenheit (°F) (increase of 0.93 degrees Celsius [°C]) between 1940 and 2014. By 2035, the Northeast region is expected to be 3.6°F (2°C) warmer on average than during the pre-industrial era (Dupigny-Giroux et al. 2018). The Northeast region has also seen a 55 percent increase in the number of heaviest 1-percent precipitation events between 1958 and 2016 (Dupigny-Giroux et al. 2018). Severe storms have become more frequent and more intense. Storm flood heights driven by hurricanes in New York City have increased by more than 3.9 feet (1.2 meters) over the last thousand years (Dupigny-Giroux et al. 2018). Due to predicted increases in average global temperatures, the frequency and intensity of extreme regional weather events such as heat waves, strong winds, and heavy precipitation are

[1] Some modeling studies suggest that changes in the level of ultraviolet radiation from the sun affect the temperatures in the stratosphere. These changes are hypothesized to affect large-scale wind patterns that in turn affect the difference of atmospheric pressure at sea level between the Icelandic Low and the Azores High (Kuroda et al. 2022). This pressure difference constitutes the NAO, which has a major effect on climate patterns on both sides of the North Atlantic.

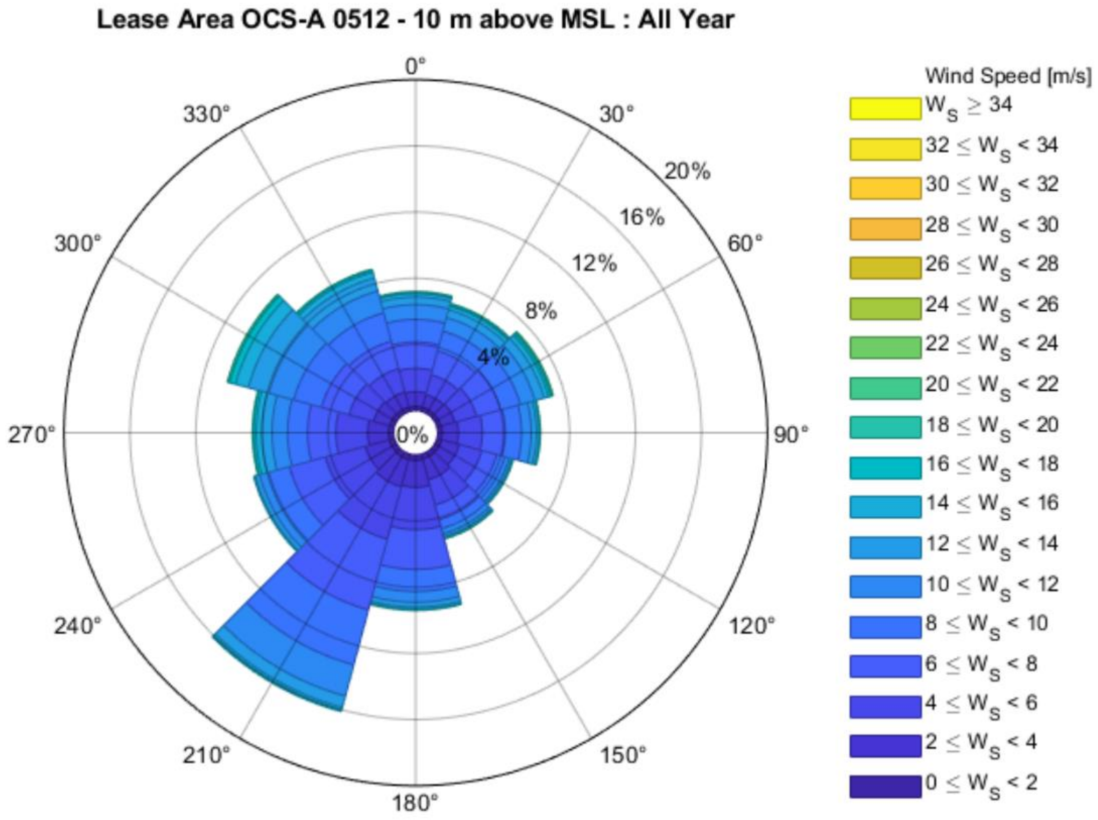
expected to increase in the coming decades (New York State Climate Action Council 2010; Dupigny-Giroux et al. 2018). In addition, the Northeast region has experienced some of the highest rates of sea level rise and ocean warming in the United States, and these exceptional increases relative to other regions are projected to continue through the end of the century (Dupigny-Giroux et al. 2018). Of note, since the retreat of the late Pleistocene glaciers after approximately 20,000 years before present, the New York and New Jersey coastline has been progressively inundated (BOEM 2012). At 21,000 years before present, sea level in the NY Bight area was approximately 394 feet (120 meters) below present levels, and at 14,400 years before present, the sea level was 256 feet (78 meters) lower (BOEM 2012; Wright et al. 2009). Studies have estimated that sea levels in the region were 43 feet (13 meters) lower than today at 6,000 years before present and 33 feet (10 meters) lower at 4,000 years before present (BOEM 2012; Miller et al. 2009). Refer to Section B.1.3 for additional information regarding projected future climate changes in the NY Bight area.

B.1.2 Current Meteorology and Climate Trends

B.1.2.1 Winds

Winds during the summer are typically from the southwest and flow parallel to the shore, while winds in the winter are typically from the northwest and flow perpendicular to the shore. Spring and fall are more variable, with wind currents from either the southwest or northeast (Schofield et al. 2008). Due to the large geographic region of the NY Bight, wind conditions are expected to vary throughout the region. As such, wind conditions of the northern and southern portions of the NY Bight are provided herein as representative wind conditions of the region encompassed by the NY Bight lease areas.

In the northern portion of the NY Bight, Empire Offshore Wind, LLC (Empire) has been collecting wind data, along with other directional wave and meteorological condition information, from a floating metocean buoy for 2 years. This metocean data will be used to inform final siting and design of the Empire Wind projects (OCS-A 0512) (Empire 2022a). Empire has also performed a preliminary metocean analysis using data from 2000 through 2020, which provides representative wind data for the northern portion of the NY Bight area. Winds measured in the northern portion of the NY Bight area are predominantly from the south to southwest and the northwest (Empire 2022a) as depicted on Figure B.1-1.



Source: Empire 2022a

Figure B.1-1. All-year wind rose at 33 feet (10 meters) AMSL for the Empire Wind lease area for 2002–2020

In addition to the wind data presented above, representative data for wind speed and wind direction are publicly available from NOAA's National Data Buoy Center for the Long Island buoy (Buoy No. 44025) (NOAA 2021a) and the New York Harbor Entrance buoy (Buoy No. 44065) (NOAA 2021b). The Long Island buoy is within the Empire Wind lease area at latitude 40.251, longitude -73.164 and is 30 nautical miles south of Islip, New York. The New York Harbor Entrance buoy is approximately 8 miles west of the Empire Wind lease area at latitude 40.369, longitude -73.703.

The most recent data available from the New York Harbor Entrance buoy are for January 2015 through December 2020. The maximum wind speed[2] recorded during this period was 47.4 miles per hour (mph) (21.2 meters per second [m/s]) in 2018, with average wind speeds from 11.2 to 15.7 mph (5 to 7 m/s) across these 6 years (Table B.1-1). Using 2017 as an example year to consider seasonal averages, the maximum wind speed was recorded in the spring of 2017 at 47.0 mph (21 m/s), although the highest average seasonal wind speed of 16.8 mph (7.5 m/s) occurred in the winter of 2017 (Table B.1-2). The average wind direction for all seasons between 2015 and 2020 was from the southwest. In other years, higher maximum wind speeds have occurred in summer and fall months due to tropical cyclones. For

[2] NOAA buoy measurements for wind speed are averaged over an 8-minute period. Higher speeds are recorded for 5- to 8-second gusts.

example, a maximum sustained wind speed of 51.4 mph (23.0 m/s) and gusts up to 70.5 mph (31.5 m/s) were recorded at the New York Harbor Entrance buoy on August 4, 2020, in association with Hurricane Isaias (NOAA 2021b).

Table B.1-1. Annual average and maximum wind speed and direction at New York Harbor Entrance buoy (Buoy No. 44065) from January 2015 to December 2020

Year	Average Wind Speed mph	Average Wind Speed m/s	Maximum Wind Speed mph	Maximum Wind Speed m/s	Average Wind Direction Degrees from True North
2015	14.1	6.3	41.6	18.6	202 (Southwest)
2016	14.5	6.5	45.0	20.1	200 (Southwest)
2017	14.3	6.4	47.0	21.0	198 (Southwest)
2018	14.1	6.3	47.4	21.2	191 (Southwest)
2019	14.1	6.3	42.9	19.2	192 (Southwest)
2020	13.9	6.2	51.4	23.0	196 (Southwest)

Source: NOAA 2021b.
Note: NOAA buoy measurements for wind speed are averaged over an 8-minute period.

Table B.1-2. Seasonal average and maximum wind speed and direction at New York Harbor Entrance buoy (Buoy No. 44065) in 2017

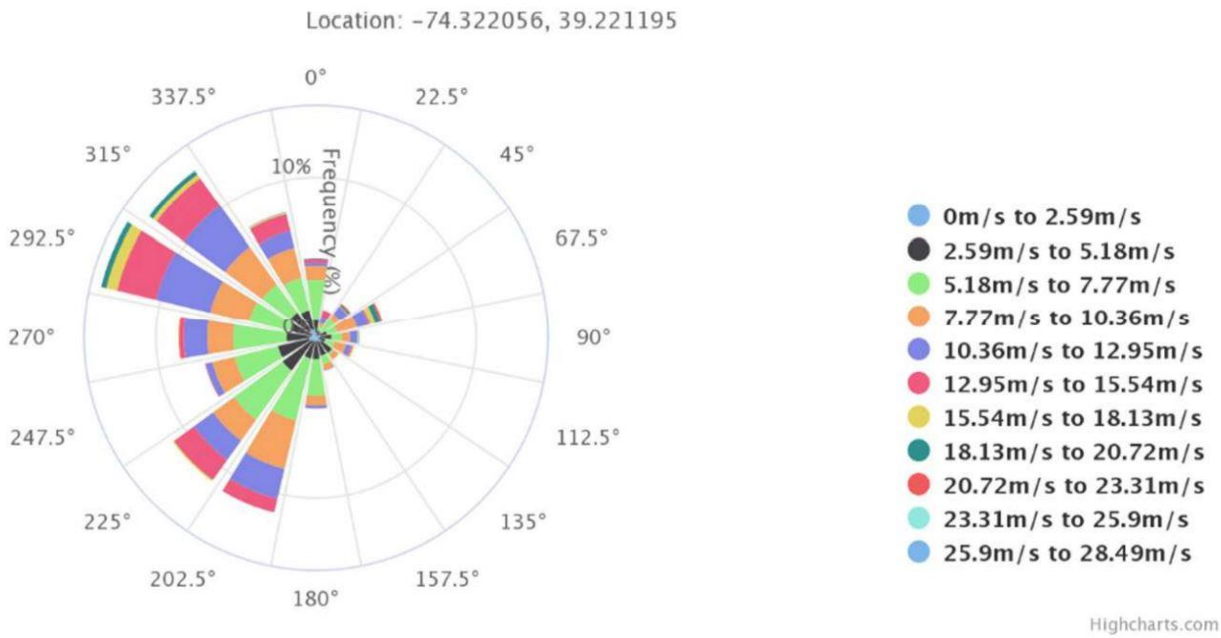
Season	Average Wind Speed mph	Average Wind Speed m/s	Maximum Wind Speed mph	Maximum Wind Speed m/s	Average Wind Direction Degrees from True North
Winter	16.8	7.5	44.3	19.8	223.9 (Southwest)
Spring	14.5	6.5	47.0	21.0	187.0 (South)
Summer	11.4	5.1	30.4	13.6	183.5 (South)
Fall	15.2	6.8	39.1	17.5	197.8 (Southwest)

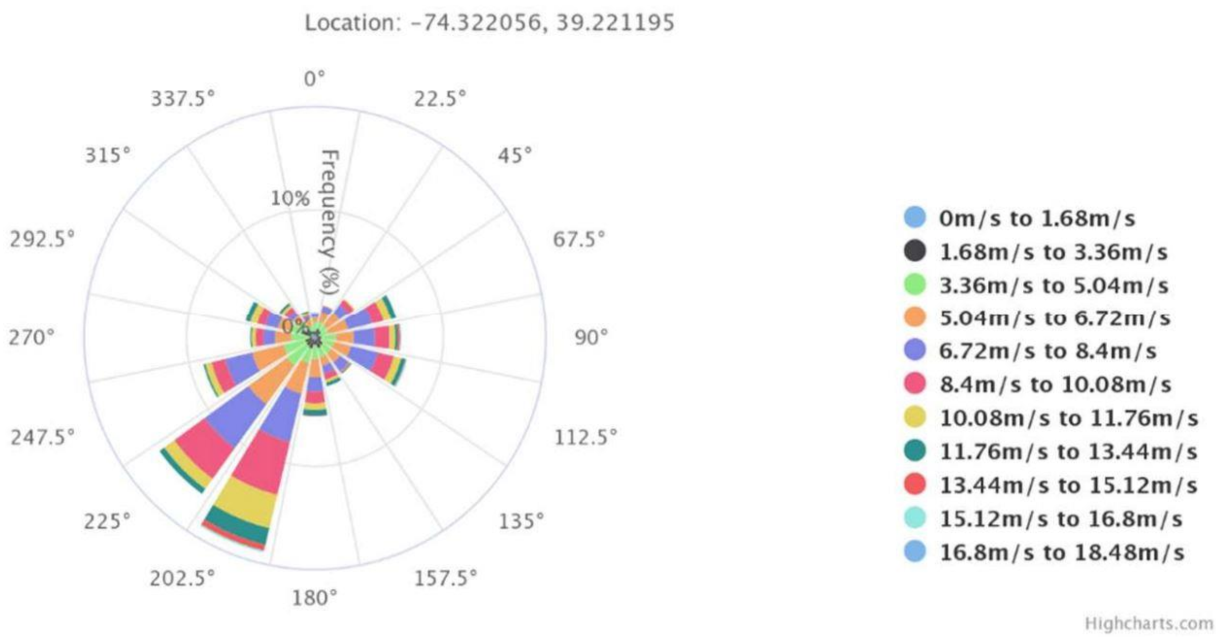
Source: NOAA 2021b.
Note: NOAA buoy measurements for wind speed are averaged over an 8-minute period.

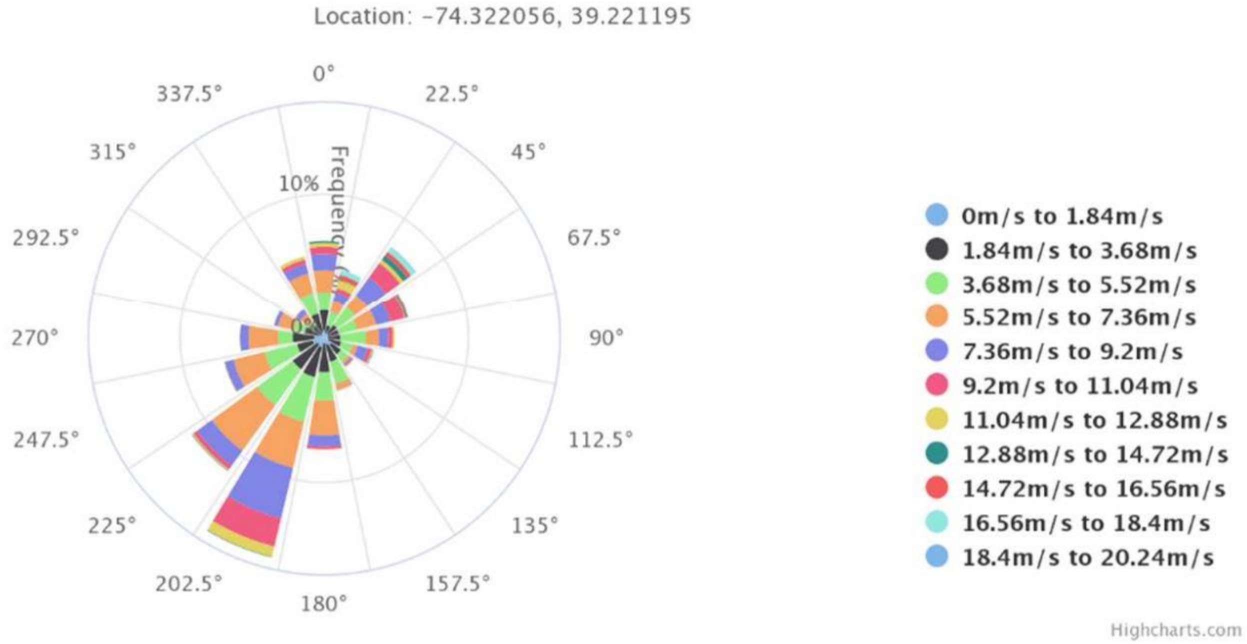
Data from the Long Island buoy (Buoy No. 44025) are available for October 1975 through December 2008. The Long Island buoy measured similar conditions as the New York Harbor Entrance buoy with a maximum wind speed of 51.0 mph (22.8 m/s) in 1991 and average wind speeds from 11.2 to 18.9 mph (5.0 to 8.4 m/s) across the 34 years recorded (NOAA 2021a).

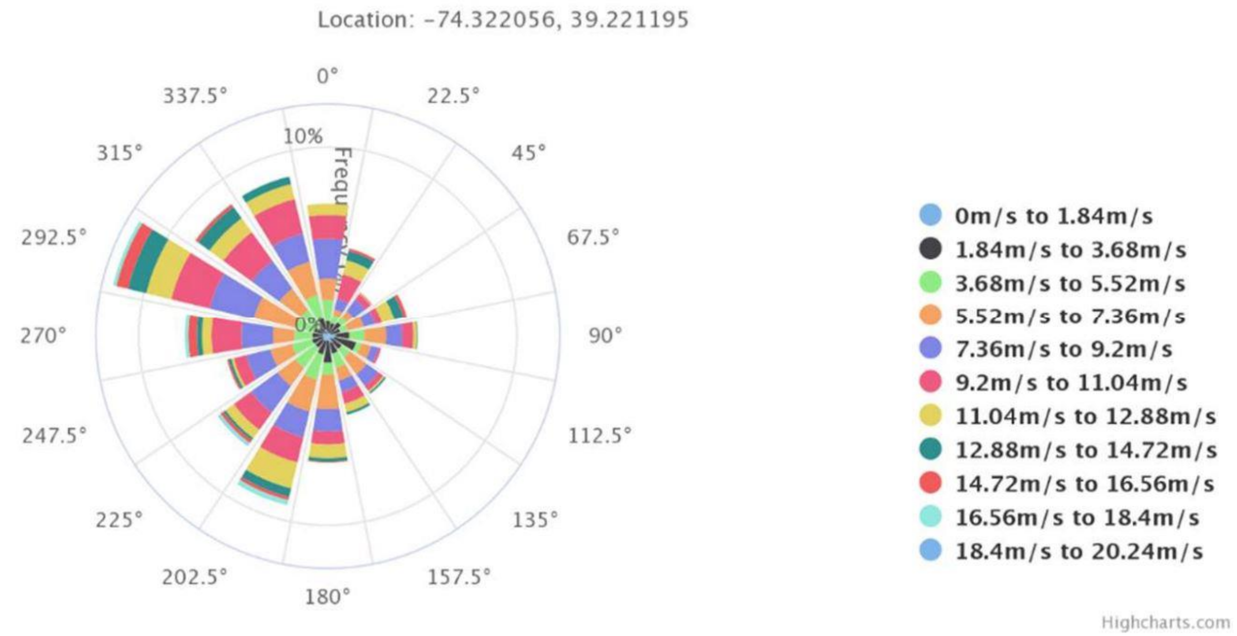
At the southern end of the NY Bight, Ocean Wind has been collecting wind and wave data from two stations in the Ocean Wind 1 lease area (OCS-A 0498): stations F220 and F230. In addition, the Metocean Data Portal, maintained by the Danish Hydrological Institute, provides wind data for the entire United States East Coast that has been generated through numerical models (Danish Hydrological Institute 2018). Data for the Ocean Wind 1 lease area were generated using a location within the Ocean Wind 1 lease area. Data from 2017 indicate wind speeds reached 63.8 mph (28.5 m/s). The highest-frequency wind directions generally were from south-southwest to northwest. Throughout the year, wind direction is variable. However, seasonal wind directions are primarily from the west/northwest during the winter months (December through February) and from the south/southwest during the summer months (June through August). Figure B.1-2 shows 3-month wind roses for January through June 2017 and July through December 2017, respectively, for a location within the Ocean Wind 1 lease area (-74.322056, 39.221195). Top wind speeds within the Ocean Wind 1 lease area peaked between January and March at 40.6 to 46.3 mph (18.1 to 20.7 m/s) from the northwest.

Extreme wind conditions on the United States East Coast are influenced by both winter storms and tropical systems. Several nor'easters occur each winter season, while hurricanes are rarer but potentially more extreme. The tropical systems therefore define the wind farm design, based on extreme wind speeds (those with recurrence periods of 50 years and beyond). Wind roses developed from the Metocean Data Portal are provided below in Figure B.1-2 (Danish Hydrological Institute 2018).









Source: Danish Hydrological Institute 2018.
Note: Wind roses identified from top to bottom: January through March 2017 (first row); April through June 2017 (second row); July through September 2017 (third row); October through December 2017 (fourth row).

Figure B.1-2. Wind rose graphs for the Ocean Wind 1 lease area

Table B.1-3 summarizes wind conditions in the region. This table shows the monthly average wind speeds, monthly average peak wind gusts, and hourly peak wind gusts for each individual month. Data from 1984 through 2008 show that monthly mean wind speeds range from a low of 10.9 mph (17.6 kilometers per hour [kph]) in July to a high of 17.4 mph (28.0 kph) in January. The monthly wind mean peak gusts reach a maximum during January at 24.1 mph (38.7 kph). The 1-hour average wind gusts reach a maximum during September at 63.3 mph (101.9 kph) (NOAA 2018). The data provided in Table B.1-3 represent wind speed data at the National Data Buoy Center buoy station No. 44009, located southeast of Cape May, New Jersey, the southern end of the NY Bight region.

Table B.1-3. Wind speed data for southeast of Cape May, New Jersey (buoy No. 44009)

Month	Monthly Average Wind Speed		Monthly Average of Hourly Peak Gust		Monthly Maximum Hourly Peak Gust	
	mph	kph	mph	kph	mph	kph
January	17.4	28.0	24.1	38.7	61.6	99.1
February	16.2	26.1	21.9	35.2	56.8	91.5
March	15.5	25.0	20.5	33.0	57.5	92.6
April	14.0	22.6	19.0	30.6	56.8	91.5
May	12.7	20.4	16.2	26.1	60.2	96.9
June	11.5	18.5	15.3	24.6	47.6	76.7
July	10.9	17.6	14.7	23.7	50.1	80.6
August	11.2	18.0	15.2	24.4	48.6	78.2
September	13.0	20.9	18.0	28.9	63.3	101.9
October	14.8	23.9	20.5	33.0	60.6	97.6
November	16.3	26.3	21.8	35.0	57.3	92.2
December	17.1	27.6	23.8	38.3	56.2	90.4
Annual	14.0	22.6	19.1	30.7	63.3	101.9

Source: NOAA 2018.

B.1.2.2 Air Temperature

NOAA's National Centers for Environmental Information, formerly the National Climatic Data Center, defines distinct climatological divisions to represent areas that are nearly climatically homogeneous. Locations within the same climatic division are considered to share the same overall climatic features and influences. The NY Bight region spans the New York coastal division or New York Climate Division 4, and the New Jersey coastal division or New Jersey Climate Division 3 (NOAA National Centers for Environmental Information 2021a).

The mean average annual air temperature in the coastal division of New York was 51.4°F (10.8°C) between 1895 and 2021 (NOAA National Centers for Environmental Information 2021b). The seasonal mean ranged from 31.9°F (-0.1°C) in winter (December through February) to 70.8°F (21.6°C) in summer (June through August) (NOAA National Centers for Environmental Information 2021b).

A summary of monthly and annual mean temperature data collected for the New York coastal division between 1895 and 2021 is presented in Table B.1-4. This data is representative of the ambient air temperatures in the northern portion of the NY Bight lease areas.

Table B.1-4. Mean temperatures for New York coastal division, 1895 to 2021

Month	Average Mean Temperature		Maximum Mean Temperature		Minimum Mean Temperature	
	°F	°C	°F	°C	°F	°C
January	30.3	-0.9	38.0	3.3	22.6	-5.2
February	30.8	-0.7	38.7	3.7	22.8	-5.1
March	38.4	3.6	46.6	8.1	30.1	-1.1
April	47.9	8.8	57.0	13.9	38.8	3.8
May	58.1	14.5	67.6	19.8	48.7	9.3
June	67.4	19.7	76.6	24.8	58.2	14.6
July	73.1	22.8	81.9	27.7	64.3	17.9
August	71.8	22.1	80.3	26.8	63.2	17.3
September	65.3	18.5	74.2	23.4	56.4	13.6
October	54.8	12.7	63.8	17.7	45.7	7.6
November	44.4	6.9	52.4	11.3	36.3	2.4
December	34.6	1.4	42.0	5.6	27.1	-2.7
Annual	**51.4**	**10.8**	**59.9**	**15.5**	**42.9**	**6.0**

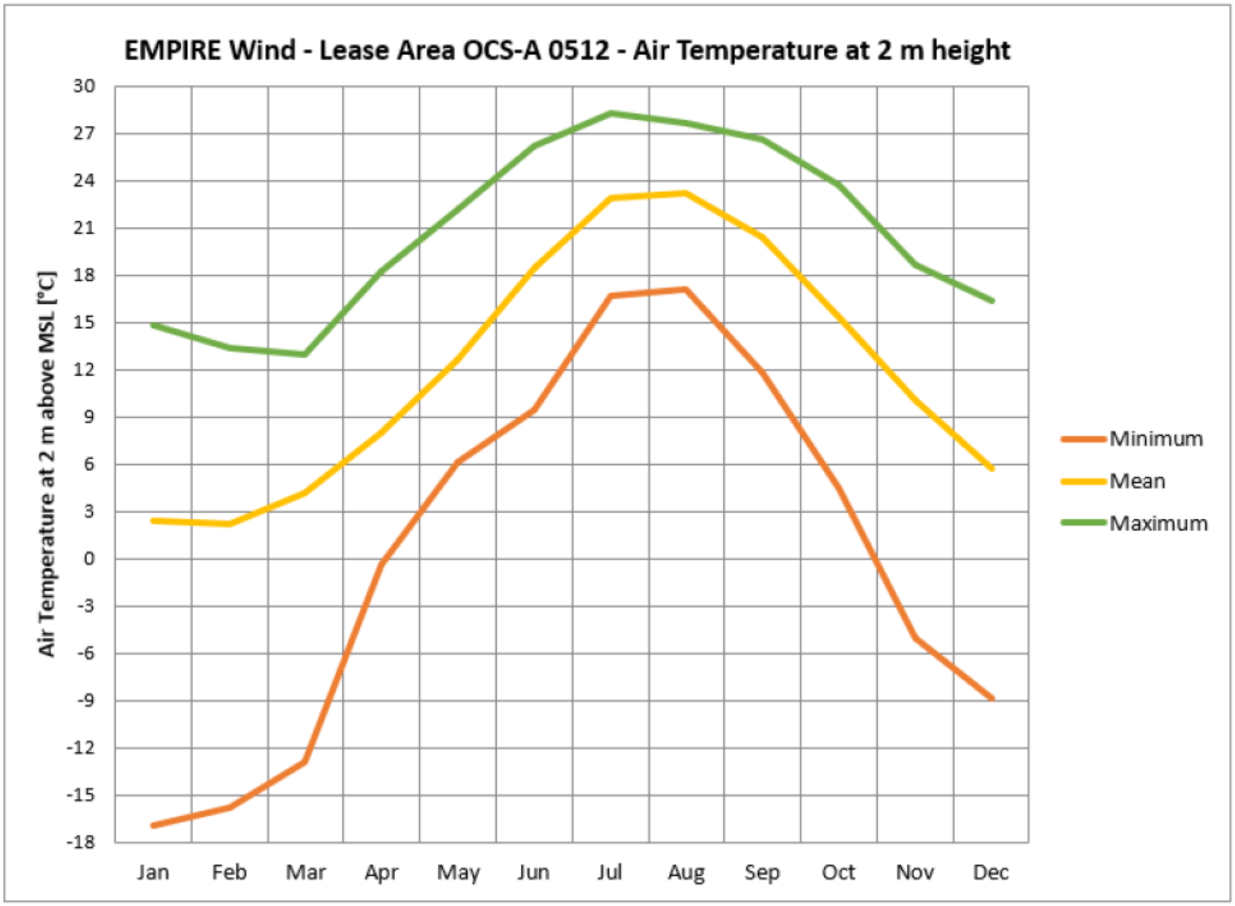
Source: NOAA National Centers for Environmental Information 2021b.

Representative air temperature information for the northern portion of the NY Bight lease areas is also available from NOAA's National Data Buoy Center Long Island buoy (Buoy No. 44025) and New York Harbor Entrance buoy (Buoy No. 44065). This information is presented in Table B.1-5 and shows air temperatures ranging from 35°F to 75°F (1.67°C to 23.90°C), with the higher temperatures during the summer months (Empire 2022b, 2022c). Minimum, mean, and maximum air temperatures occurring over the region at 6.6 feet (2 meters) AMSL from the period between 2002 and 2019 are shown graphically on Figure B.1-3.

Table B.1-5. Average air temperature at NOAA buoys in the Empire Wind study area

Month	Average Air Temperature in °F (°C)	
	Buoy No. 44065 (2008–2018)	Buoy No. 44025 (2007–2018)
January	35.01 (1.67)	37.98 (3.32)
February	36.66 (2.59)	38.70 (3.72)
March	39.58 (4.21)	41.49 (5.27)
April	46.65 (8.14)	47.03 (8.35)
May	56.71 (13.73)	55.33 (12.96)
June	66.04 (18.91)	65.46 (18.59)
July	73.92 (23.29)	73.29 (22.94)
August	75.02 (23.90)	73.98 (23.32)
September	69.69 (20.94)	68.61 (20.34)
October	59.94 (15.52)	60.53 (15.85)
November	49.10 (9.50)	51.06 (10.59)
December	42.13 (5.63)	43.77 (6.54)

Sources: Empire 2022b; Empire 2022c.



Source: Empire 2022a.

Figure B.1-3. Minimum, mean, and maximum air temperature at 6.6 feet (2 meters) AMSL at Lease Area OCS-A 0512

Ambient air temperature data at locations representative of the southern portion of the NY Bight lease areas are generally moderate and similar to those collected at the northern portion of the NY Bight lease areas. The mean average annual air temperature in the coastal division of New Jersey was 53.1°F (11.8°C) between 1895 and 2021 (NOAA National Centers for Environmental Information 2021b). Air temperature data collected from the Office of the New Jersey State Climatologist, Rutgers University, which averaged the annual, seasonal, and monthly means in southern and coastal areas of New Jersey for 1985–2009, similarly indicate that the annual mean air temperature was 53.2°F (11.8°C) (NJDEP 2010). The mean seasonal air temperature between 1985 and 2010 during the winter ranged from approximately 32–43°F (0–6°C) and in the spring from 54–64°F (12–18°C). The mean seasonal air temperature during the summer ranged from approximately 68–75°F (20–24°C) and during the fall from 53–65°F (12–18°C). The lowest average air temperatures occur in January and the highest in July (NJDEP 2010; NCDC 2021a). Recent offshore air temperature data were downloaded from NOAA buoys near the NY Bight lease areas. Data between 2014 and 2018 were downloaded from Atlantic City, New Jersey (Buoy No. ACYN4), which is located near the southern portion of the NY Bight lease areas. Table B.1-6 summarizes average temperatures at the Atlantic City buoy.

Table B.1-6. Representative temperature data for the Ocean Wind 1 project area

NOAA Station	Year	Annual Average °F/°C	No. of Observations
Atlantic City Buoy (No. ACYN4)	2014	53.8/12.1	86,432
	2015	55.4/13.0	86,357
	2016	55.6/13.1	81,252
	2017	55.9/13.3	85,557
	2018	52.9/11.6	63,856

Source: Ocean Wind 2022.

Given the cold air temperatures experienced during many Mid-Atlantic winters, there is potential for icing of equipment and vessels above the water line in the NY Bight area. Cook and Chatterton (2008) analyzed icing events in Delaware Bay for winters from 1997 to 2007 and found that icing events are a common occurrence during January, February, and March. The worst winter, as far as icing is concerned, experienced by the Delaware Bay region from 1997 through 2007, was in 2002/2003, during which 21 icing events occurred. Delaware Bay experiences approximately eight events annually where the variables favoring icing are consistent for 3 or more hours.

In addition, the occurrence of fog in the Mid-Atlantic states is driven by regional-scale weather patterns and local topographic and surface conditions. The interaction between various weather systems and the physical state of the local conditions is complex. Ward and Croft (2008) found that high-pressure systems result in heavy fog over the Delaware Bay and nearby Atlantic coastal areas. During the 2006/2007 winter season (December–February), Delaware Coastal Airport (Georgetown, Delaware) reported 45 fog events, 4 of which were described as dense fog (Ward and Croft 2008).

B.1.2.3 Precipitation

In the northern portion of the NY Bight lease areas, precipitation in the New York coastal region primarily takes the form of rain and snow. The mean annual precipitation for the coastal region of New York between 1895 and 2021 was 44.89 inches (114.0 centimeters) (NOAA National Centers for Environmental Information 2021c). During the same period, the mean monthly precipitation ranged from 3.40 inches (8.6 centimeters) in February to 4.19 inches (10.6 centimeters) in March (NOAA National Centers for Environmental Information 2021c). A summary of monthly and annual mean precipitation data collected for the New York coastal division between 1895 and 2021 is presented in Table B.1-7.

Table B.1-7. Mean precipitation for New York coastal division, 1895 to 2021

	Total Mean Precipitation	
Month	Inches	Centimeters
January	3.6	9.1
February	3.4	8.6
March	4.2	10.7
April	3.9	9.9
May	3.8	9.7
June	3.5	8.9
July	3.7	9.4

Month	Total Mean Precipitation	
	Inches	Centimeters
August	4.1	10.4
September	3.6	9.1
October	3.6	9.1
November	3.8	9.7
December	4.0	10.2
Annual	**44.9**	**114.0**

Source: NOAA National Centers for Environmental Information 2021c.

Similarly, in the southern portion of the NY Bight lease areas, precipitation in the New Jersey coastal region primarily takes the form of rain and snow (NJDEP 2010). Average monthly precipitation data from the National Climatic Data Center are presented in Table B.1-8.

Table B.1-8. Mean precipitation in the New Jersey coastal division[1]

Month	Precipitation (inches/centimeters)	
	Atlantic City Marina, New Jersey	Brant Beach, Beach Haven, New Jersey
January	3.08/7.82	3.25/8.26
February	2.87/7.29	2.86/7.26
March	4.02/10.21	3.97/10.08
April	3.39/8.61	3.26/8.28
May	3.22/8.18	2.78/7.06
June	2.68/6.81	3.05/7.75
July	3.31/8.41	3.92/9.96
August	3.92/9.96	3.71/9.42
September	3.08/7.82	2.78/7.06
October	3.47/8.81	3.65/9.27
November	3.35/8.51	2.91/7.39
December	3.62/9.19	3.36/8.53
Annual Average	**3.33/8.47**	**3.29/8.36**

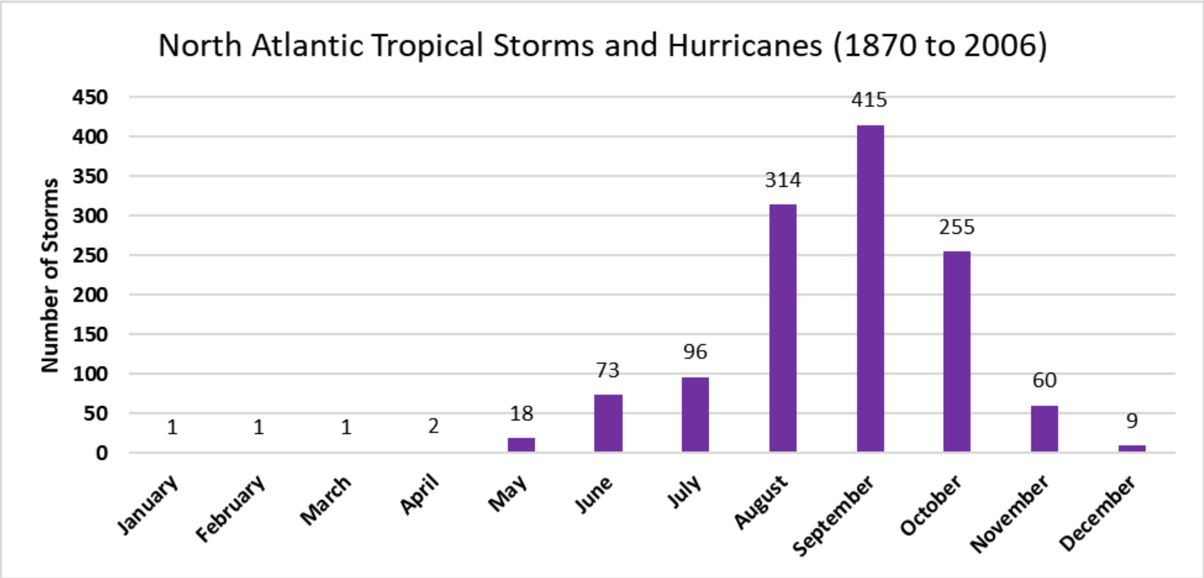
Sources: NCDC 2021a, 2021b.
[1] Precipitation is recorded in melted inches (snow and ice are melted to determine monthly equivalent).

Snowfall amounts can vary quite drastically within small distances. Data from Lewes, Delaware, approximately 60 miles southwest of Atlantic City, New Jersey, show that the annual snowfall average is approximately 12 inches (30.5 centimeters), and the month with the highest snowfall is January, averaging around 4 inches (10.2 centimeters) (WRCC 2022).

B.1.2.4 Extreme Storm Events

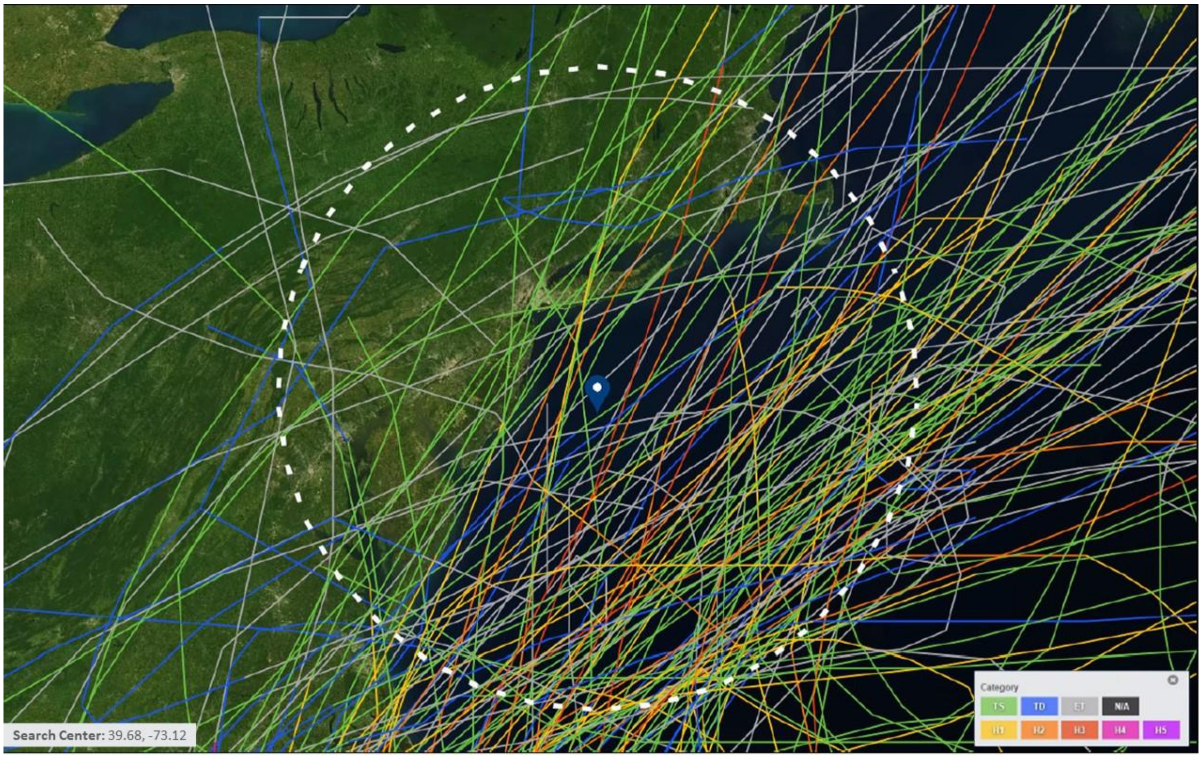
Strong weather events in the NY Bight area include, but are not limited to, hurricanes and tropical storms in the warmer months and nor'easters during the winter months. The number of tropical storms, including hurricanes, generally reaches a peak during the period from August to early October at the northern end of the NY Bight area (Empire 2022a). This is consistent with the peak period for tropical cyclones throughout the North Atlantic basin (Figure B.1-4) (McAdie et al. 2009). Most hurricane events within the Atlantic generally occur from mid-August to late October, with the majority of all events occurring in September (Donnelly et al. 2004). At the southern end of the NY Bight area along the New Jersey coast, hurricanes occur every 3 to 4 years within 90 to 170 miles of the coast, on average (NJDEP 2010). Such storms that travel along the coastline of the eastern United States have the potential to affect the NY Bight lease areas and adjacent coastal communities with high winds and severe flooding.

Figure B.1-5 identifies the hurricane tracks surrounding the NY Bight area between 1950 and 2019 (NOAA 2021c). The category for each storm is designated by a color for each segment of its track on Figure B.1-5. Table B.1-9 lists each of the hurricanes affecting the NY Bight area and the corresponding maximum storm categories while the hurricane was within approximately 200 nautical miles (370 kilometers) of the NY Bight lease areas for the corresponding period (NOAA 2021c). The 200-nautical mile (370-kilometer) radius circle was centered upon the approximate center point of the NY Bight lease areas within Lease Area OCS-A-0538, located at latitude 39.68, longitude -73.12. Most historical hurricanes affecting the NY Bight area are Category 1, but storms as powerful as Category 5 hurricanes have passed nearby the NY Bight lease areas. The New York State ClimAID assessment determined that intense hurricanes are likely to increase in frequency over the 21st century for New York City and Long Island (New York State Climate Action Council 2010).



Source: McAdie et al. 2009.

Figure B.1-4. Total number of North Atlantic basin tropical storms and hurricanes by month from 1870 to 2006



Source: NOAA 2021c.
Note: TS = Tropical Storm; TD = Tropical Depression; ET = Extratropical Storm; N/A = None Applied; H1 = Category 1; H2 = Category 2; H3 = Category 3; H4 = Category 4; H5 = Category 5.

Figure B.1-5. Tracks of hurricanes, tropical storms, tropical depressions, and extratropical storms between 1950 and 2019 within a 200-nautical mile (370-kilometer) radius around Lease Area OCS-A-0538

Table B.1-9. Hurricanes with tracks passing within 200 nautical miles (370 kilometers) of the NY Bight lease areas between 1950 and 2021

Storm Name	Year	Maximum Storm Category	Storm Name	Year	Maximum Storm Category
Ida	2021	Category 4 Hurricane	Bob	1991	Category 3 Hurricane
Henri	2021	Category 1 Hurricane	Lili	1990	Category 1 Hurricane
Elsa	2021	Category 1 Hurricane	Charley	1986	Category 1 Hurricane
Zeta	2020	Category 3 Hurricane	Gloria	1985	Category 4 Hurricane
Isaias	2020	Category 1 Hurricane	Danny	1985	Category 1 Hurricane
Dorian	2019	Category 5 Hurricane	Josephine	1984	Category 2 Hurricane
Michael	2018	Category 5 Hurricane	Diana	1984	Category 4 Hurricane
Florence	2018	Category 4 Hurricane	Dennis	1981	Category 1 Hurricane
Maria	2017	Category 5 Hurricane	David	1979	Category 5 Hurricane
Jose	2017	Category 4 Hurricane	Belle	1976	Category 3 Hurricane
Hermine	2016	Category 1 Hurricane	Dawn	1972	Category 1 Hurricane
Arthur	2014	Category 2 Hurricane	Agnes	1972	Category 1 Hurricane
Sandy	2012	Category 3 Hurricane	Ginger	1971	Category 2 Hurricane
Irene	2011	Category 3 Hurricane	Unnamed	1970	Category 1 Hurricane
Earl	2010	Category 4 Hurricane	Gerda	1969	Category 3 Hurricane
Hanna	2008	Category 1 Hurricane	Gladys	1968	Category 2 Hurricane

Storm Name	Year	Maximum Storm Category	Storm Name	Year	Maximum Storm Category
Noel	2007	Category 1 Hurricane	Doria	1967	Category 2 Hurricane
Ernesto	2006	Category 1 Hurricane	Alma	1966	Category 3 Hurricane
Ophelia	2005	Category 1 Hurricane	Gladys	1964	Category 4 Hurricane
Cindy	2005	Category 1 Hurricane	Dora	1964	Category 4 Hurricane
Jeanne	2004	Category 3 Hurricane	Alma	1962	Category 1 Hurricane
Ivan	2004	Category 5 Hurricane	Esther	1961	Category 5 Hurricane
Gaston	2004	Category 1 Hurricane	Donna	1960	Category 4 Hurricane
Charley	2004	Category 4 Hurricane	Gracie	1959	Category 4 Hurricane
Alex	2004	Category 3 Hurricane	Cindy	1959	Category 1 Hurricane
Kyle	2002	Category 1 Hurricane	Daisy	1958	Category 4 Hurricane
Gustav	2002	Category 2 Hurricane	Flossy	1956	Category 1 Hurricane
Gordon	2000	Category 1 Hurricane	Ione	1955	Category 4 Hurricane
Irene	1999	Category 2 Hurricane	Diane	1955	Category 2 Hurricane
Floyd	1999	Category 4 Hurricane	Connie	1955	Category 4 Hurricane
Dennis	1999	Category 2 Hurricane	Hazel	1954	Category 4 Hurricane
Earl	1998	Category 2 Hurricane	Edna	1954	Category 3 Hurricane
Bonnie	1998	Category 3 Hurricane	Carol	1954	Category 3 Hurricane
Danny	1997	Category 1 Hurricane	Carol	1953	Category 5 Hurricane
Edouard	1996	Category 4 Hurricane	Barbara	1953	Category 1 Hurricane
Bertha	1996	Category 3 Hurricane	Able	1952	Category 2 Hurricane
Felix	1995	Category 4 Hurricane	How	1951	Category 2 Hurricane
Allison	1995	Category 1 Hurricane	Able	1951	Category 1 Hurricane
Emily	1993	Category 3 Hurricane	Dog	1950	Category 4 Hurricane
Unnamed	1991	Category 1 Hurricane	Able	1950	Category 3 Hurricane

Source: NOAA 2021c.
Notes: The NY Bight lease areas were represented by a point with the following coordinates: latitude 39.68, longitude -73.12. Hurricane categories are identified as 1 through 5 based on the Saffir-Simpson scale.

Hurricane Sandy, which occurred in 2012, provides an example of extreme storm conditions that have occurred in the region. In coastal New Jersey, Hurricane Sandy caused the highest storm surges and greatest inundation on land. The storm surge and large waves from the Atlantic Ocean meeting up with rising waters from back bays such as Barnegat Bay and Little Egg Harbor caused barrier islands to be completely inundated (Blake et al. 2013). In Atlantic City and Cape May, tide gauges measured storm surges of 5.8 and 5.2 feet (1.8 and 1.6 meters), respectively (Blake et al. 2013). Marine observations at the Cape May National Ocean Service (CMAN4) recorded sustained wind speeds at 52 knots (60 mph; 27 m/s) and an estimated inundation of 3.5 feet (1.1 meters) (Blake et al. 2013).

In coastal New York, the storm surge created by Hurricane Sandy was more severe than a 100-year extreme event (Empire 2022). In Bergen Point West Reach on the northern side of Staten Island, tide gauges measured a storm surge of 9.56 feet (2.91 meters) and estimated inundation of 9.53 feet (2.9 meters). At the Battery on the southern tip of Manhattan, tide gauges measured storm surges of 9.40 feet (2.87 meters) and estimated inundation of 9.00 feet (2.7 meters) (Blake et al. 2013). Marine observations at NOAA Buoy No. 44025 and NOAA Buoy No. 44065 recorded maximum sustained wind speeds of 49 knots (56.4 mph; 25.2 m/s) and 48 knots (55.2 mph; 24.7 m/s), respectively (Blake et al. 2013).

B.1.3 Projected Future Climate

Projected future climate conditions include changes to the above metocean characteristics as well as other climate characteristics, including ocean warming, ocean acidification, and sea level rise. Uncertainty in the magnitude of such climate changes exists due to the uncertainty of future GHG emissions rates—which are directly related to the rate of climate change—and the inherent uncertainty of climate modeling methods. Future climate change projections are categorized by GHG emissions scenarios ranging from low global GHG emissions scenarios to high global GHG emissions scenarios. Low global GHG emissions scenarios imply less change to climate conditions, while high global GHG scenarios imply greater change to climate conditions. The subsections below describe the expected changes to climate conditions in the NY Bight area under the U.S. Environmental Protection Agency (USEPA) (2017) lower (Representation Concentration Pathways [RCP] 4.5) and higher (RCP 8.5) GHG emissions scenarios, unless noted otherwise.[3] Future projected changes to wind conditions in the NY Bight area are not included, as such changes are not explicitly characterized by available studies.

B.1.3.1 Air Temperature

In the Northeast United States between 1940 and 2014, the average winter-spring air temperature has risen 1.67°F (increase of 0.93°C) (Dupigny-Giroux et al. 2018). By 2035, under both lower and higher GHG emissions scenarios, the Northeast region is expected to be 3.6°F (2°C) warmer on average than during the pre-industrial era (Dupigny-Giroux et al. 2018). This would be the largest increase in the contiguous United States and would occur as much as two decades before global average temperatures reach a similar milestone (Dupigny-Giroux et al. 2018). By 2050, in New Jersey, temperatures are expected to increase by 4.1 to 5.7°F (2.3 to 3.2°C) based on the lower and higher GHG emissions scenarios, respectively (NJDEP 2020; Horton et al. 2015). Similarly, in New York State, under the lower and higher GHG emissions scenarios, average annual temperatures are projected to increase by 2.0 to 3.4°F by the 2020s, 4.1 to 6.8°F by the 2050s, and 5.3 to 10.1°F by the 2080s (Horton et al. 2014). According to the New York State Department of Conservation, the annual statewide average temperature in New York has warmed 3°F (1.7°C) since 1970 (NYSDEC 2023).

B.1.3.2 Precipitation

The recent dominant trend in precipitation throughout the Northeast United States has been toward increases in rainfall intensity, with recent increases in intensity exceeding those in other regions in the contiguous United States (Dupigny-Giroux et al. 2018). The Northeast region has seen a 55 percent increase in the number of heaviest 1 percent precipitation events between 1958 and 2016 (Dupigny-Giroux et al. 2018). Severe storms have become more frequent and more intense. Further increases in rainfall intensity are expected, with increases in precipitation expected during the winter and spring with little change in the summer (Dupigny-Giroux et al. 2018). The proportion of winter precipitation falling as rain has already increased and will likely continue to do so in response to a northward shift in

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[3] The RCPs are identified by their approximate total radiative forcing (not emissions) in the year 2100, relative to 1750: 2.6 watts per meter squared (RCP 2.6), 4.5 watts per meter squared (RCP 4.5), and 8.5 watts per meter squared (RCP 8.5) (USEPA 2017).

the snow-rain transition zone projected under both lower and higher climate change scenarios (Dupigny-Giroux et al. 2018). The northward shifts are about 2° latitude under the lower emissions scenario and 4° latitude under the higher emissions scenario (Ning and Bradley 2015). By 2100, in New Jersey, heavy precipitation events are projected to occur two to five times more often and with more intensity than the 20th century under a low emissions scenario (RCP 2.6) versus the higher emissions scenario (RCP 8.5) (Walsh et al. 2014; NJDEP 2020). Small decreases in the amount of precipitation may occur in New Jersey in the summer months, resulting in greater potential for more frequent and prolonged droughts (NJDEP 2020). Regional precipitation across New York State is projected to increase by approximately 1 to 8 percent by the 2020s, 3 to 12 percent by the 2050s, and 4 to 15 percent by the 2080s under the lower and higher emissions scenarios (Horton et al. 2014).

B.1.3.3 Extreme Storm Events

Storm flood heights driven by hurricanes in New York City have increased by more than 3.9 feet (1.2 meters) over the last thousand years (Dupigny-Giroux et al. 2018). Due to predicted increases in average global temperatures, the frequency and intensity of extreme regional weather events such as heat waves, strong winds, and heavy precipitation are expected to increase in the coming decades (New York State Climate Action Council 2010; Dupigny-Giroux et al. 2018). The strongest hurricanes are anticipated to become both more frequent and more intense in the future, with greater amounts of precipitation (Dupigny-Giroux et al. 2018). More than 80 percent of open-coast north and Mid-Atlantic beaches are predicted to overwash during a Category 4 hurricane (Dupigny-Giroux et al. 2018). Additionally, 32 percent of open-coast north and Mid-Atlantic beaches are predicted to overwash during an intense future nor'easter type storm (Dupigny-Giroux et al. 2018).

B.1.3.4 Ocean Warming

Ocean and coastal temperatures along the Northeast United States Continental Shelf have increased by 0.06°F (0.033°C) per year from 1982 to 2016, which is three times faster than the global average rate of 0.018°F (0.01°C) per year (Dupigny-Giroux et al. 2018). From 2007 to 2016, the regional warming rate was four times faster than the trend from 1982 to 2016 at a warming rate of 0.25°F (0.14°C) per year (Dupigny-Giroux et al. 2018). Climate projections indicate that in the future the ocean over the Northeast United States Continental Shelf will experience more warming than most other ocean regions around the world (Dupigny-Giroux et al. 2018).

B.1.3.5 Ocean Acidification

Coastal waters in the Northeast United States region are sensitive to the effects of ocean acidification because they have low capacity for maintaining stable pH levels (Dupigny-Giroux et al. 2018). These waters are particularly vulnerable to acidification due to hypoxia (low-oxygen conditions) induced by eutrophication, and freshwater inputs, which are expected to increase as climate change progresses (Dupigny-Giroux et al. 2018). Since the industrial age, pH levels have declined by 0.1 pH units, from a global average of 8.2 to 8.1, which represents a 30 percent increase in acidity due to the logarithmic scale in which pH is measured (NJDEP 2020). If GHG emissions continue at current rates, ocean pH levels are expected to fall another 0.3 to 0.4 pH units by the end of the century, representing another 120 percent increase in acidity and creating an ocean that is more acidic than has been seen for the past 20 million years (NJDEP 2020).

Fisheries and aquaculture rely on shell-forming organisms that can suffer in more acidic conditions (Dupigny-Giroux et al. 2018). Many coastal communities in the Northeast United States region also have strong social and cultural ties to marine fisheries; in some communities, fisheries represent an important economic activity as well (Dupigny-Giroux et al. 2018). Future ocean warming and acidification, which are expected under all scenarios considered, would affect fish stocks and fishing opportunities available to coastal communities (Dupigny-Giroux et al. 2018).

B.1.3.6 Sea Level Rise

Along the Mid-Atlantic coast (from Cape Hatteras, North Carolina to Cape Cod, Massachusetts), several decades of tide gauge data through 2009 have shown that sea level rise rates were three to four times higher than the global average rate (Dupigny-Giroux et al. 2018). The region's sea level rise rates are increased by land subsidence, changes in the Gulf Stream, and geologic influences related to the loss of the North American ice sheet, all of which contribute to a higher sea level relative to land elevation (Dupigny-Giroux et al. 2018; NJDEP 2020). Projections for the Northeast United States region suggest that sea level rise will be greater than the global average of approximately 0.12 inches (3 millimeters) per year (Dupigny-Giroux et al. 2018). Two probable sea level rise scenarios project sea level rise of 2 and 4.5 feet (0.6 and 1.4 meters) on average in the region by 2100 (Dupigny-Giroux et al. 2018). By 2050, New Jersey will likely experience at least a 0.9- to 2.1-foot increase (above the levels in 2000), 1.4- to 3.1-foot increase by 2070, and potentially a 2.0- to 5.1-foot increase by 2100 (NJDEP 2020). Increases in sea level will exacerbate flooding in the coastal area caused by more intense rain events and storms (NJDEP 2020). In addition, low-lying coastal areas in New Jersey are already experiencing tidal flooding, even on sunny days in the absence of precipitation events (NJDEP 2020). Along the New York State coastline, sea level is projected to rise by 3 to 8 inches by the 2020s, 9 to 21 inches by the 2050s, and 14 to 39 inches by the 2080s (Horton et al. 2014). According to the New York State Department of Conservation, sea levels along New York's coast and in the Hudson River have already risen more than a foot since the year 1900 (about 1.2 inches per decade) (NYSDEC 2023).

B.1.4 Potential General Impacts of Offshore Wind Facilities on Meteorological Conditions

A known impact of offshore wind facilities on meteorological conditions is the "wake effect" (Christiansen and Hasager 2005). A WTG extracts energy from the free flow of wind, creating turbulence downstream of the WTG. The resulting wake effect is the aggregated influence of the WTGs for the entire wind farm on the available wind resource and the energy production potential of any facility downstream. Christiansen and Hasager (2005) observed offshore wake effects from existing facilities via satellite with synthetic aperture radar to last anywhere from 1.2 to 12.4 miles (2 to 20 kilometers) depending on ambient wind speed, direction, degree of atmospheric stability, and the number of turbines within a facility. During stable atmospheric conditions, these offshore wakes can be longer than 43.5 miles (70 kilometers).

Stoelinga et al. (2022) modeled the potential for a hypothetical large wind project to create wake impacts in the NY Bight lease areas. The modeling scenario used a set of meteorological conditions likely to result in the maximum wake impact on potential projects in the lease areas. The selected meteorology consisted of a sample of 16 days that had the greatest occurrence of southwest winds (from the 190°–240° sector) and speeds in the range of 13–25 mph (6–11 m/s). The modeling predicted a reduction in wind speed at hub height of 7 percent at up to 100 km away from the upwind project, with greater speed reductions at shorter distances. Annual average reductions in wind speed due to WTG wake would be less. The authors conclude that potential wake impacts of WTGs should be accounted for in planning of wind farms.

Under certain conditions, offshore wind farms can also affect atmospheric temperature and moisture downwind of the facilities. For example, from September 2016 to October 2017, a study using aircraft observations accompanied by mesoscale simulations examined the spatial dimensions of micrometeorological impacts from a wind energy facility in the North Sea (Siedersleben et al. 2018). Measurements and associated modeling indicated that measurable redistribution of moisture and heat were possible up to 62 miles (100 kilometers) downwind of the wind farm. However, this occurred only when (1) there was a strong, sustained temperature inversion at or below hub height and (2) wind speeds were greater than approximately 13.4 mph (6 m/s) (Siedersleben et al. 2018). Typically, air temperature will decrease with height above the sea surface in the lower atmosphere (i.e., the troposphere), and air will freely rise and disperse up to a “mixing height” (Holzworth 1972; Ramaswamy et al. 2006). A temperature inversion occurs when a warmer overlying air mass causes temperatures to increase with height; a strong inversion inhibits the further rise of cooler surface air masses, thus limiting the mixing height (Ramaswamy et al. 2006). Therefore, the North Sea study suggests that rapidly spinning turbines with hub heights at or above a strong inversion may induce mixing between air masses that would otherwise remain separated, which can significantly affect temperature and humidity downwind of a wind farm.

The mixing height over open waters of the North Atlantic Ocean is typically greater than 1,640 feet (500 meters) AMSL, except over areas of upwelling, where the mixing height may be closer to the sea surface (Holzworth 1972; Fuhlbrügge et al. 2013). Table B.1-10 presents atmospheric mixing height data from the nearest measurement location to the NY Bight area (Atlantic City, New Jersey). As shown in the table, the minimum average mixing height is 1,279 feet (390 meters), while the maximum average mixing height is 3,996 feet (1,218 meters).

Table B.1-10. Representative seasonal mixing height data

Season	Data Hours Included[1]	Atlantic City, New Jersey Average Mixing Height (feet/meters)
Winter (December, January, February)	Morning: No-Precipitation Hours	2,047/624
	Morning: All Hours	2,024/617
	Afternoon: No-Precipitation Hours	2,539/774
	Afternoon: All Hours	1,280/390
Spring (March, April, May)	Morning: No-Precipitation Hours	1,788/545
	Morning: All Hours	2,100/640
	Afternoon: No-Precipitation Hours	3,924/1,196
	Afternoon: All Hours	1,637/499
Summer (June, July, August)	Morning: No-Precipitation Hours	1,677/511
	Morning: All Hours	1,857/566
	Afternoon: No-Precipitation Hours	3,996/1,218
	Afternoon: All Hours	2,280/695
Fall (September, October, November)	Morning: No-Precipitation Hours	1,588/484
	Morning: All Hours	2,129/649
	Afternoon: No-Precipitation Hours	3,241/988
	Afternoon: All Hours	1,562/476
Annual Average	Morning: No-Precipitation Hours	1,768/539
	Morning: All Hours	2,034/620
	Afternoon: No-Precipitation Hours	3,451/1,052
	Afternoon: All Hours	1,667/508

Source: USEPA 2021.
[1] Missing values are not included.

Díaz et al. (2019) reported that measurements over the Atlantic Ocean between 1981 and 2010 indicated a trend of decreasing strength and thickness of inversion layers, accompanied by a general increase in the mixing height, which is correlated with an increase in sea surface temperatures. Therefore, WTG hub heights are expected to remain well below the typical mixing height and associated temperature inversions over the open ocean in the Mid-Atlantic region. As such, the redistribution of moisture and heat due to rotor-induced vertical mixing, and any associated shifts to the microclimate, would be limited to the immediate vicinity of a wind facility in this region.

Additionally, mixing height affects air quality by acting as a lid on the height to which air pollutants can vertically disperse. Lower mixing heights allow less air volume for pollutant dispersion and lead to higher ground-level pollutant concentrations than do higher mixing heights.

Modeling studies suggest that the atmospheric wake from wind farms also can affect sea surface temperature, horizontal and vertical ocean currents, and vertical stratification. Christiansen et al. (2022) estimated that "[sea] surface temperature primarily increases in the vicinity of offshore wind farms" due to the wind farm wake effect and that the resulting "large-scale surface heating of up to 0.18 °F (0.1 °C) imitates the effects of climate change" though the wake-related changes are about one order of magnitude smaller than the average variations due to climate change.

B.1.5 Air Quality Standards

Air quality is measured in comparison to the NAAQS, which are standards established by the USEPA pursuant to the Clean Air Act (42 USC 7409) for several common air pollutants, known as criteria pollutants, to protect human health and welfare. Primary standards are set at levels to protect human health with a margin of safety. Secondary standards are set at levels to protect public welfare including plants, animals, ecosystems, and materials. The criteria pollutants are CO, lead, NO_2, O_3, PM_{10}, $PM_{2.5}$, and SO_2. New Jersey and New York have established ambient air quality standards that are similar to the NAAQS. Table B.1-11 shows the NAAQS as well as the state ambient air quality standards for New Jersey and New York for the criteria pollutants.

Table B.1-11. National and state ambient air quality standards

Pollutant	Averaging Period	National Ambient Air Quality Standards (µg/m³)		New Jersey Ambient Air Quality Standards (µg/m³)		New York Ambient Air Quality Standards (µg/m³)	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
Carbon Monoxide (CO)	8-hour[1]	10,000	None	10,000	10,000	None	None
	1-hour[1]	40,000	None	40,000	40,000	None	None
Lead (Pb)	Rolling 3-month average[2]	0.15	0.15	1.5	1.5	None	None
Nitrogen Dioxide (NO_2)	Annual[2]	100	100	100	100	None	None
	1-hour[3]	188	None	None	None	None	None
Ozone (O_3)	8-hour[4]	137 (70 ppb)	137 (70 ppb)	None	None	None	None
	1-hour[1]	None	None	235	160	None	None
Particulate Matter (PM_{10})	24-hour[5]	150	150	None	None	None	None
Particulate Matter ($PM_{2.5}$)	Annual[6]	9.0	15	None	None	None	None
	24-hour[7]	35	35	None	None	None	None
Sulfur Dioxide (SO_2)	Annual[2]	80	None	80	60	80	80
	24-hour[1]	None	None	365	260	365	365
	3-hour[1]	None	1,300	None	1,300	1,300	1,300
	1-hour[8]	196	None	None	None	None	None

Source: 40 CFR 50; NJDEP 1991; NYSDEC 2022.
[1] Not to be exceeded more than once per year.
[2] Not to be exceeded.
[3] 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
[4] Annual 4th-highest daily maximum 8-hour concentration, averaged over 3 years.
[5] Not to be exceeded more than once per year on average over 3 years.
[6] Annual mean, averaged over 3 years.
[7] 98th percentile, averaged over 3 years.
[8] 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
µg/m³ = micrograms of pollutant per cubic meter of air; ppb = parts per billion.

B.2 Birds

NYSERDA conducted aerial digital surveys for avian and marine wildlife between 2018 and 2019 in the NY Bight area (NYSERDA 2022). The aerial data provides coverage for all of four NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, and OCS-A 0544), a portion of OCS-A 0542, and none of OCS-A 0541. Table B.2-1 identifies the number of observations by species and by lease area, and Figure B.2-1 shows the geographic distribution of the observations.

Table B.2-1. NYSERDA aerial avian survey species observations

Species	OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0542		OCS-A 0544		Total	Total %
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	
Auk-species unknown		0.0%		0.0%	1	0.7%		0.0%		0.0%	1	0.1%
Black-legged Kittiwake	37	9.5%	14	4.3%	7	4.8%	2	11.1%		0.0%	60	6.2%
Bonaparte's Gull		0.0%		0.0%	85	58.6%		0.0%	12	14.8%	97	10.1%
Comic/Forster's Tern		0.0%		0.0%	1	0.7%	1	5.6%		0.0%	2	0.2%
Common Loon	7	1.8%	21	6.4%	22	15.2%	2	11.1%	2	2.5%	54	5.6%
Dovekie		0.0%		0.0%		0.0%	3	16.7%		0.0%	3	0.3%
Great Black-backed Gull		0.0%	1	0.3%	1	0.7%	2	11.1%	10	12.3%	14	1.5%
Great Shearwater	9	2.3%		0.0%		0.0%		0.0%		0.0%	9	0.9%
Gull-species unknown – Large	1	0.3%		0.0%		0.0%		0.0%	1	1.2%	2	0.2%
Gull-species unknown – Small	8	2.1%	2	0.6%	9	6.2%		0.0%	27	33.3%	46	4.8%
Herring Gull	9	2.3%	6	1.8%	1	0.7%	1	5.6%	17	21.0%	34	3.5%
Loon-species unknown	1	0.3%		0.0%		0.0%		0.0%	1	1.2%	2	0.2%
Murre/Razorbill	5	1.3%	1	0.3%		0.0%		0.0%	2	2.5%	8	0.8%
Northern Fulmar	1	0.3%	1	0.3%		0.0%		0.0%		0.0%	2	0.2%
Northern Gannet	7	1.8%	3	0.9%	9	6.2%	5	27.8%	2	2.5%	26	2.7%
Red Phalarope	76	19.5%	273	83.2%	2	1.4%		0.0%	2	2.5%	353	36.7%
Red/Red-necked Phalarope	65	16.7%		0.0%		0.0%		0.0%		0.0%	65	6.8%
Red-necked Phalarope	4	1.0%		0.0%		0.0%		0.0%		0.0%	4	0.4%
Red-throated Loon	9	2.3%	2	0.6%	6	4.1%		0.0%	5	6.2%	22	2.3%
Shearwater-species unknown – Large	140	35.9%		0.0%		0.0%		0.0%		0.0%	140	14.6%
Shearwater-species unknown – Small		0.0%	1	0.3%		0.0%		0.0%		0.0%	1	0.1%
Sooty Shearwater		0.0%		0.0%	1	0.7%		0.0%		0.0%	1	0.1%
Storm-petrel-species unknown	11	2.8%	3	0.9%		0.0%	2	11.1%		0.0%	16	1.7%
Total	**390**	**100.0%**	**328**	**100.0%**	**145**	**100.0%**	**18**	**100.0%**	**81**	**100.0%**	**962**	**100.0%**

Source: NYSERDA 2022.

NYSERDA remote metocean data from one buoy (latitude 39.9692, longitude -72.7166) in NY Bight lease area OCS-A 0537 and one buoy (latitude 39.54677, longitude -73.4292) in NY Bight lease area OCS-A 0539 detected a total of 215 bird passes consisting of nine species between September 2019 and September 2022 (Normandeau Associates Inc. 2022). The bat and bird species and total count observations data collected by the NYSERDA remote metocean buoys are shown in Table B.2-2.

Table B.2-2. NYSERDA remote metocean buoy bat and bird species and total count observations

	OCS-A 0537		OCS-A 0539			
Species	**Count**	**%**	**Count**	**%**	**Total Count**	**Total %**
American Redstart	1	1.0%	2	1.6%	3	1.3%
Green Heron		0.0%	1	0.8%	1	0.4%
Herring Gull	82	85.4%	121	93.8%	203	90.2%
Least Bittern	2	2.1%		0.0%	2	0.9%
Palm Warbler	1	1.0%		0.0%	1	0.4%
Ring-billed Gull		0.0%	1	0.8%	1	0.4%
White-throated Sparrow	2	2.1%		0.0%	2	0.9%
Wood Thrush		0.0%	1	0.8%	1	0.4%
Yellow Warbler	1	1.0%		0.0%	1	0.4%
Silver-haired bat	6	6.3%	3	2.3%	9	4.0%
Unknown low frequency species	1	1.0%		0.0%	1	0.4%
Grand Total	**96**	**100.0%**	**129**	**100.0%**	**225**	**100.0%**

Source: Normandeau Associates Inc. 2022.

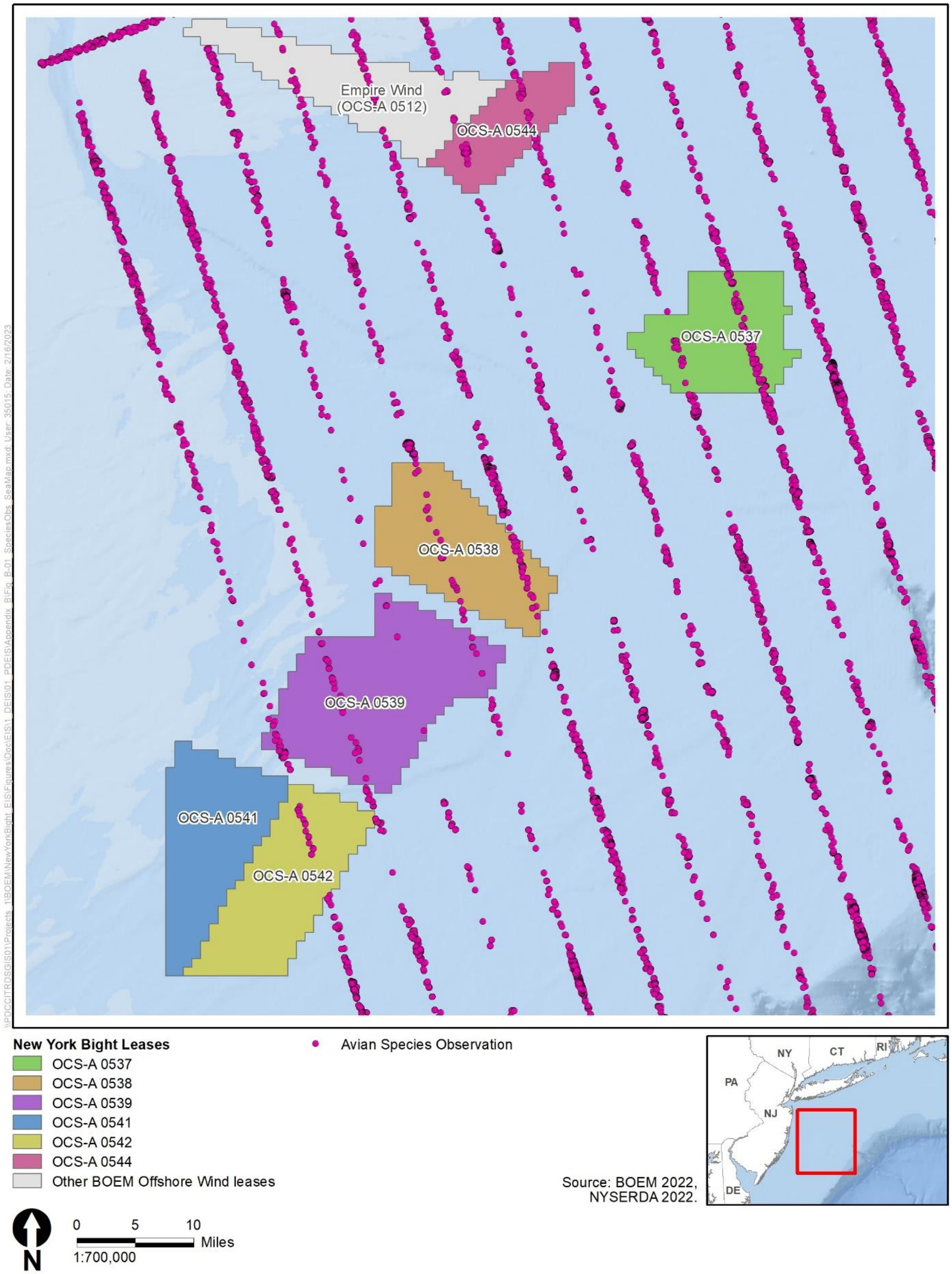
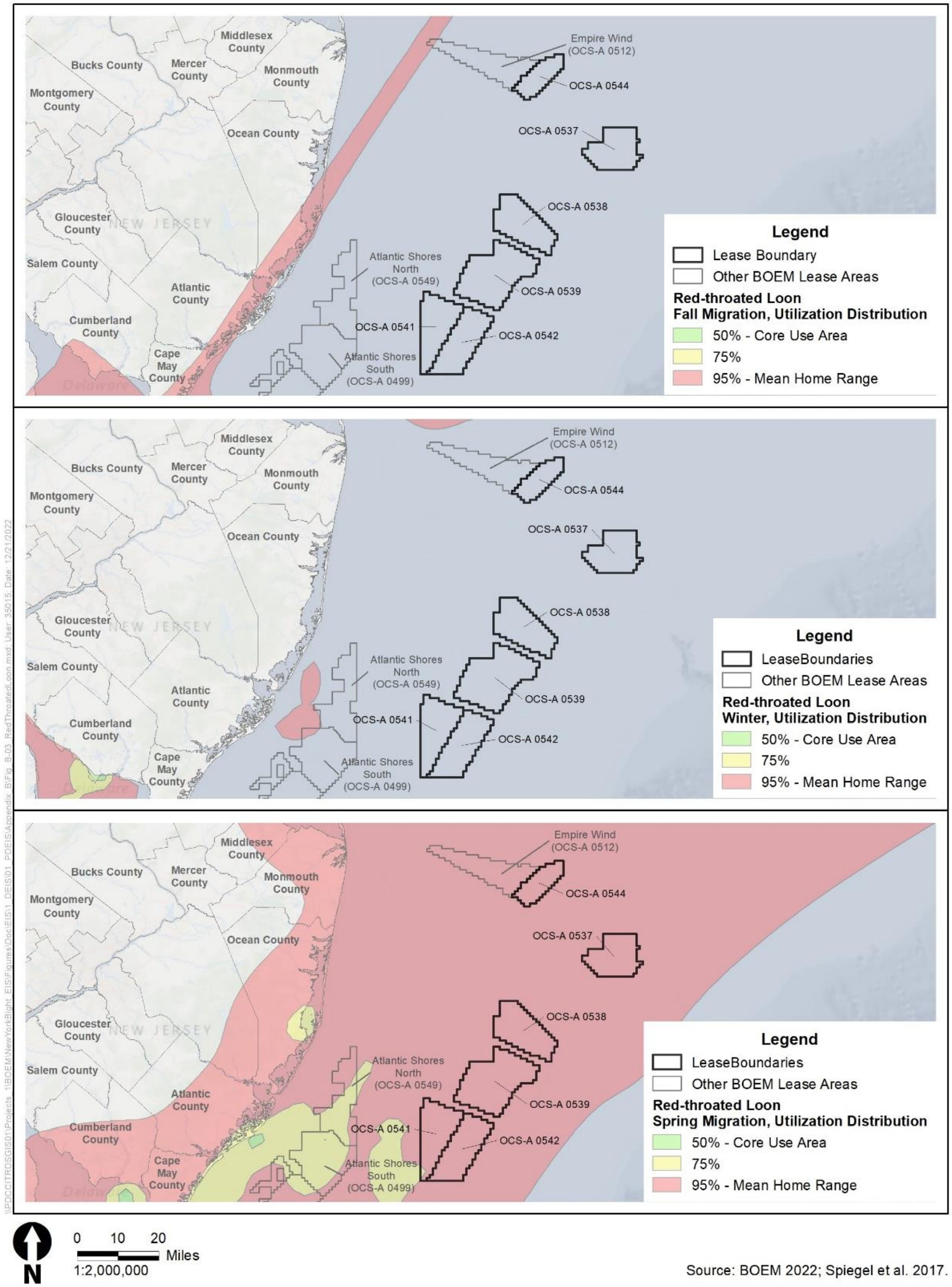


Figure B.2-1. NYSERDA species observation

Datasets from the Northeast Ocean Data Portal show fine-scale use and movement patterns from three species of diving bird—red-throated loon (*Gavia stellata*), surf scooter (*Melanitta perspicillata*), and northern gannet (*Morus bassanus*)—over the course of 5 years. The data were collected throughout the Mid-Atlantic United States waters and represent the probability that an animal will occur within a specific area during a specified time of year, i.e., utilization distributions. As shown on Figure B.2-2 and Figure B.2-3, red-throated loon and surf scoter are less active within the geographic analysis area during fall migration and overwinter distribution, but heavily utilize the Atlantic Flyway during spring migration. In contrast, the northern gannet uses the Mid-Atlantic Flyway and passes through the geographic analysis area year-round for foraging and migration (Figure B.2-4).



Source: BOEM 2022; Spiegel et al. 2017.

Figure B.2-2. Northeast Ocean Data Portal data – red-throated loon use along Northeastern Atlantic Shore

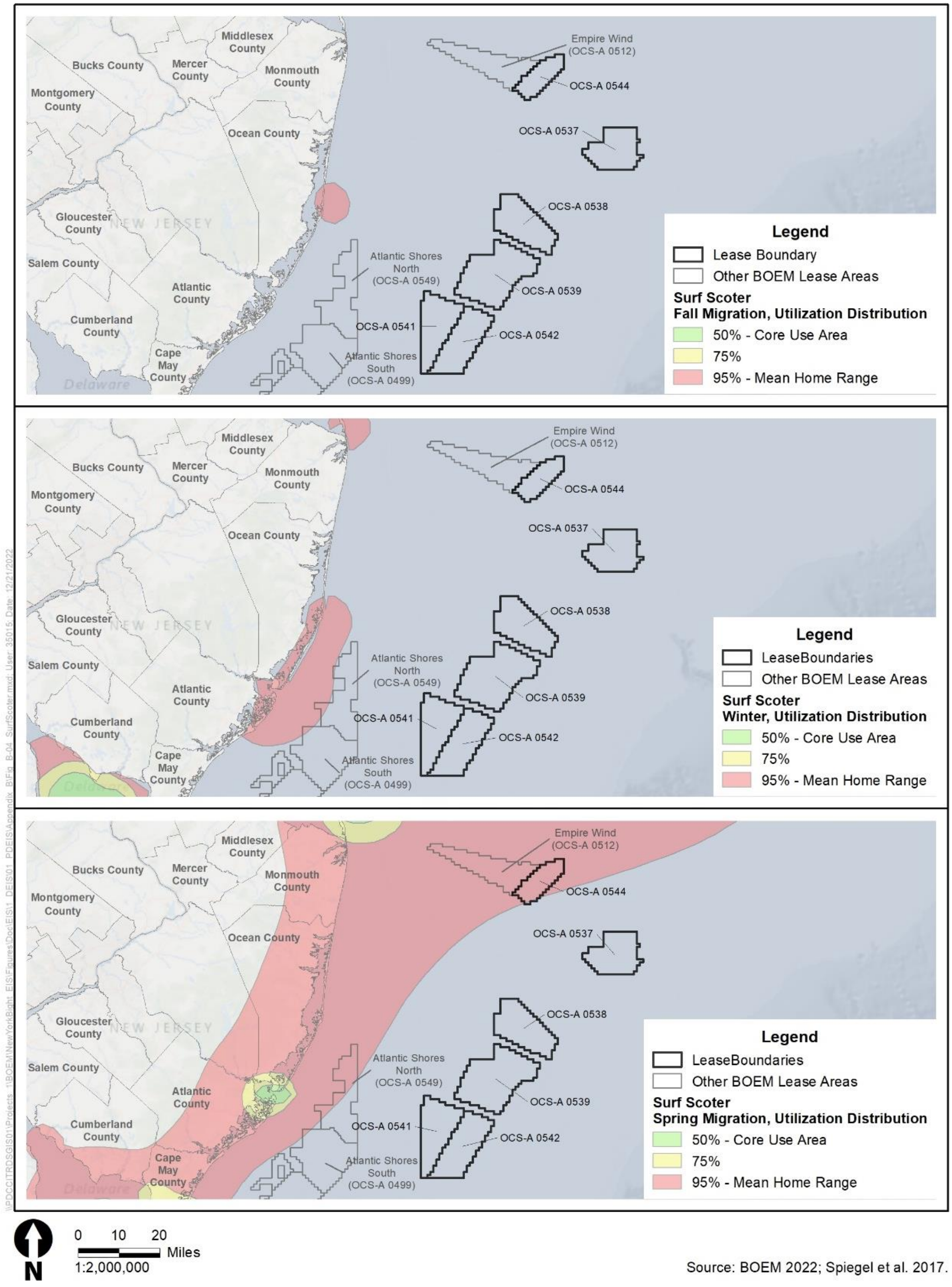
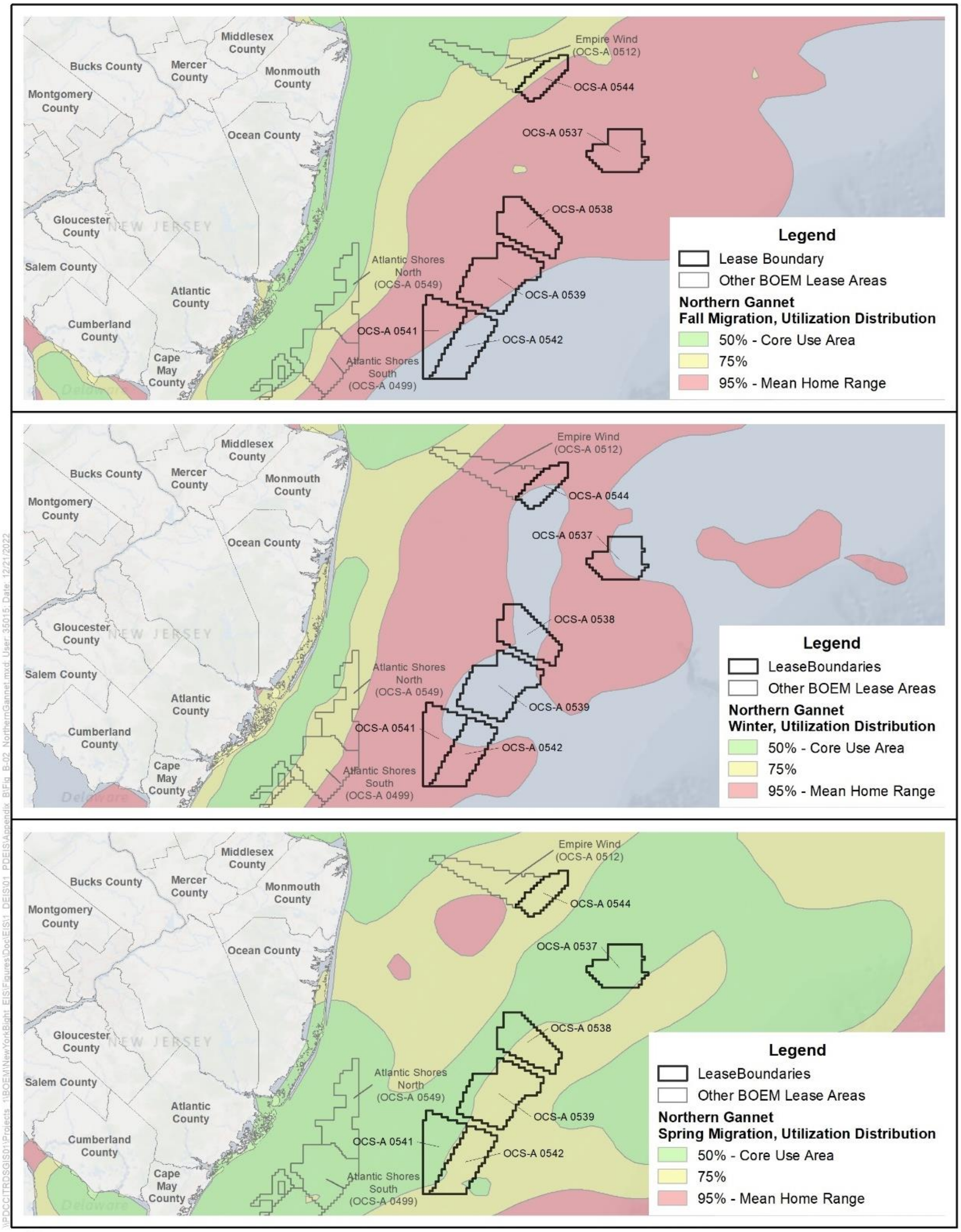


Figure B.2-3. Northeast Ocean Data Portal Data – surf scoter use along Northeastern Atlantic Shore



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Source: BOEM 2022; Spiegel et al. 2017.

Figure B.2-4. Northeast Ocean Data Portal Data – northern gannet use along Northeastern Atlantic Shore

B.3 Wetlands

Table B.3-1 summarizes National Wetlands Inventory (NWI) mapped wetlands in the geographic analysis area. This table is equivalent to Tables 3.5.8-1 and 3.5.8-2 in Section 3.5.8, *Wetlands*, but shows NWI data instead of New Jersey Department of Environmental Protection (NJDEP) and New York State Department of Environmental Conservation (NYSDEC) wetland data.

Table B.3-1. NWI wetland communities in the geographic analysis area

Wetland Community	Acres	Percent of Total
Estuarine and Marine Wetland	136,216	38.3%
Freshwater Emergent Wetland	10,860	3.0%
Freshwater Forested/Shrub Wetland	209,036	58.7%
Total	356,112	100.0%

Source: USFWS 2021.

B.4 Demographics, Employment, and Economics

The analysis presented in Section 3.6.3, *Demographics, Employment, and Economics*, is based on the data included in the tables provided in this appendix. The data have all been downloaded from publicly available sources at the United States Census Bureau and the National Oceanic and Atmospheric Administration. The tables include information from coastal counties in New York and New Jersey within the geographic analysis area.

Table B.4-1. Population and trends within the demographics, employment, and economic geographic analysis area (2000, 2010, and 2020)

Jurisdiction	Population Density (persons/ square mile)	Population (2000)	Population (2010)	Population (2020)	% Change (2000–2020)	% Change (2010–2020)
New York Counties						
Albany County	602	295,106	304,086	314,368	6.5	3.4
Kings County	39,438	2,467,006	2,509,828	2,727,393	10.6	8.7
Nassau County	4,905	1,336,713	1,341,669	1,393,978	4.3	3.9
New York County	429	1,540,547	1,588,767	1,687,834	9.6	6.2
Rensselaer County	247	152,684	159,340	160,923	5.4	1.0
Queens County	22,124	2,229,379	2,230,722	2,405,464	7.9	7.8
Richmond County	8,618	152,684	159,340	160,923	11.3	5.5
Suffolk County	1,675	445,235	469,615	495,522	7.0	2.0
New Jersey Counties						
Atlantic County	494	253,674	274,648	274,534	8.2	0
Burlington County	578	424,453	449,129	461,860	8.8	2.8
Camden County	2,365	506,707	513,275	523,485	3.3	2
Cape May County	379	102,314	97,212	95,263	-6.9	-2
Cumberland County	319	146,263	156,699	154,152	5.4	-1.6

Jurisdiction	Population Density (persons/ square mile)	Population (2000)	Population (2010)	Population (2020)	% Change (2000–2020)	% Change (2010–2020)
Essex County	6,850	792,253	784,037	863,728	9	10.2
Gloucester County	939	256,524	289,150	302,294	17.8	4.5
Hudson County	15,692	610,135	635,652	724,854	18.8	14
Middlesex County	2,791	752,880	810,758	863,162	14.6	6.5
Monmouth County	1,375	616,849	630,461	643,615	4.3	2.1
Ocean County	1,014	523,357	577,564	637,229	21.8	10.3
Salem County	195	64,069	65,980	64,837	1.2	-1.7
Union County	5,599	526,183	537,369	575,345	9.3	7.1

Sources: U.S Census Bureau 2000, 2010, 2020.

Table B.4-2. Age distributions of counties within the demographics, employment, and economic geographic analysis area (2020)

Jurisdiction	0–17	18–34	35–64	65+	Median Age
New York Counties					
Albany County	20%	18%	39%	15.6%	37.8
Kings County	19%	22%	40%	16.5%	35.2
Nassau County	23%	20%	41%	13.6%	41.7
New York County	22%	21%	40%	17.5%	37.5
Rensselaer County	14%	23%	41%	16.2%	39.8
Queens County	20%	23%	41%	17.4%	39.0
Richmond County	20%	18%	35%	16.5%	40.1
Suffolk County	22%	25%	39%	15.9%	41.5
New Jersey Counties					
Atlantic County	22%	27%	37%	15.8%	41.7
Burlington County	22%	28%	37%	17.5%	41.6
Camden County	21%	21%	41%	16.6%	38.8
Cape May County	23%	24%	39%	15.4%	49.6
Cumberland County	18%	21%	41%	25.8%	37.6
Essex County	24%	22%	40%	14.9%	37.6
Gloucester County	24%	20%	40%	13.4%	40.5
Hudson County	22%	22%	40%	15.4%	35.3
Middlesex County	21%	23%	39%	11.7%	38.6
Monmouth County	22%	22%	40%	14.7%	43.3
Ocean County	21%	24%	40%	17.1%	42.7
Salem County	24%	31%	38%	22.4%	42.1
Union County	22%	23%	40%	18.3%	38.7

Source: U.S Census Bureau 2020

Table B.4-3. Race and ethnicity demographics (2020)

Jurisdiction	Minority Populations							White, Non-Hispanic or Latino
	Black	Asian	American Indian/Alaska Native	Native Hawaiian/Other Pacific Islander	Other	Two or More Races	Hispanic or Latino	
New York Counties								
Albany County	12.9%	7.7%	0.2%	0.1%	0.5%	4.7%	6.9%	67.0%
Kings County	26.7%	13.6%	0.1%	0.0%	1.2%	4.1%	18.9%	35.4%
Nassau County	10.5%	11.7%	0.1%	0.0%	0.9%	2.6%	18.4%	55.8%
New York County	11.8%	13.0%	0.1%	0.1%	0.7%	3.7%	23.8%	46.8%
Rensselaer County	7.3%	3.5%	0.2%	0.0%	0.5%	5.3%	5.9%	77.3%
Queens County	15.9%	27.3%	0.4%	0.0%	2.3%	3.5%	27.8%	27.8%
Richmond County	9.4%	11.9%	0.1%	0.0%	0.6%	2.3%	19.6%	56.1%
Suffolk County	7.0%	4.3%	0.2%	0.0%	0.6%	2.7%	21.8%	63.4%
New Jersey Counties								
Atlantic County	14.2%	7.9%	0.1%	0.0%	0.5%	3.5%	19.6%	54.2%
Burlington County	16.2%	5.6%	0.1%	0.1%	0.7%	4.8%	8.7%	63.8%
Camden County	18.2%	6.2%	0.1%	0.1%	0.0%	3.5%	18.2%	53.3%
Cape May County	3.5%	0.9%	0.1%	0.0%	0.3%	3.3%	7.8%	84.0%
Cumberland County	17.1%	1.3%	0.6%	0.0%	0.4%	3.5%	34.4%	42.7%
Essex County	37.5%	5.4%	0.1%	0.0%	1.4%	3.9%	24.4%	27.2%
Gloucester County	10.4%	3.1%	0.1%	0.0%	0.4%	4.1%	7.3%	74.5%
Hudson County	9.8%	17.0%	0.1%	0.0%	1.3%	2.8%	40.4%	28.5%
Middlesex County	9.1%	26.4%	0.1%	0.0%	0.8%	2.5%	22.4%	38.6%
Monmouth County	6.1%	5.6%	0.1%	0.0%	0.7%	3.4%	12.5%	71.6%
Ocean County	2.8%	1.8%	0.1%	0.0%	0.6%	2.6%	10.4%	81.7%
Salem County	14.0%	1.0%	0.3%	0.0%	0.4%	4.4%	10.1%	69.8%

Jurisdiction	Minority Populations							White, Non-Hispanic or Latino
	Black	Asian	American Indian/Alaska Native	Native Hawaiian/Other Pacific Islander	Other	Two or More Races	Hispanic or Latino	
Union County	19.5%	5.6%	0.1%	0.0%	1.1%	3.0%	34.0%	36.7%

Source: U.S Census Bureau 2020

Table B.4-4. Housing characteristics within the demographics, employment, and economic geographic analysis area (2019)

Jurisdiction	Housing Units	Occupied (%)	Vacant (%)	Seasonal Vacancy Rate (%)	Median Value (Owner-Occupied)	Median Monthly Rent (Renter Occupied)
New York Counties						
Albany County	141,553	89%	11%	1.3%	$222,500	$894
Kings County	1,044,493	92%	8%	0.9%	$706,000	$1,322
Nassau County	472,572	95%	5%	0.8%	$493,500	$1,651
New York County	880,085	86%	14%	5.3%	$987,700	$1,646
Queens County	896,333	95%	5%	3.9%	$212,600	$1,629
Rensselaer County	73,011	89%	11%	2.0%	$188,700	$822
Richmond County	180,325	92%	8%	0.5%	$504,800	$1,177
Suffolk County	575,960	85%	15%	9.3%	$397,400	$1,606
New Jersey Counties						
Atlantic County	128,251	78%	22%	13.4%	$217,900	$958
Burlington County	179,414	93%	7%	0.3%	$251,200	$1,190
Camden County	206,078	91%	9%	0.2%	$197,800	$918
Cape May County	99,312	40%	60%	50.8%	$300,500	$975
Cumberland County	56,448	90%	10%	0.7%	$162,500	$858
Essex County	317,314	90%	10%	0.2%	$386,000	$1,044
Gloucester County	113,485	92%	8%	0.3%	$219,700	$1,049
Hudson County	282,039	92%	8%	0.8%	$378,000	$1,265
Middlesex County	301,566	95%	6%	0.5%	$344,100	$1,349
Monmouth County	261,579	90%	10%	4.8%	$421,900	$1,278
Ocean County	283,297	80%	20%	13.8%	$279,000	$1,250
Salem County	27,595	87%	13%	0.7%	$184,600	$836
Union County	202,267	94%	6%	0.2%	$367,200	$1,167

Source: U.S Census Bureau 2019

Table B.4-5. New York and New Jersey employment, unemployment, per capita income, and population living below poverty level (2019)

Jurisdiction	Total Employment	Per Capita Income	Unemployment Rate (%)	Population Living Below Poverty Level (%)
New York Counties				
Albany County	168,609	$66,252	4.5	7.1
Kings County	1,308,399	$60,231	6.2	15.9
Nassau County	716,106	$116,100	3.9	3.8
New York County	955,427	$86,553	5.2	11.8
Queens County	1,851,947	$96,631	3.6	12.2
Rensselaer County	85,822	$68,991	4.7	7.8
Richmond County	225,088	$82,783	4.6	9.4
Suffolk County	785,803	$101,031	4.2	4.5
New Jersey Counties				
Atlantic County	139,427	$62,110	8.4	9.9
Burlington County	241,940	$87,416	5.6	4.1
Camden County	267,725	$70,451	6.6	9.1
Cape May County	45,904	$67,074	6.6	6.9
Cumberland County	66,521	$54,149	7.3	11.9
Essex County	411,493	$61,510	8.1	12.8
Gloucester County	158,168	$87,283	5.5	4.4
Hudson County	377,168	$71,189	5.2	11.8
Middlesex County	429,146	$89,533	5.2	6.2
Monmouth County	335,725	$99,733	4.9	4.7
Ocean County	275,104	$70,909	5.1	6.5
Salem County	31,221	$66,842	6	8.6
Union County	299,082	$80,198	5.7	6.9

Source: U.S. Census Bureau 2019

Table B.4-6. At place employment by industry (2019)

	Agriculture, Forestry, Fishing, Hunting	Mining, Quarrying, Oil/Gas	Utilities	Construction	Manufacturing	Wholesale Trade	Retail Trade	Transportation and Warehouse	Information
New York Counties									
Albany County	415	45	996	6,889	8,078	2,947	16,084	4,465	3,304
Kings County	1,108	267	4,534	62,088	38,822	26,902	112,845	77,522	56,473
Nassau County	923	79	4,784	39,026	30,149	22,353	67,006	33,784	19,977
New York County	503	68	1,803	17,381	26,719	18,037	62,802	22,676	56,020
Queens County	865	83	4,211	66,835	32,339	20,539	69,331	73,837	23,110
Rensselaer County	467	24	795	5,479	6,030	1,583	7,859	3,833	1,504
Richmond County	180	89	1,763	16,347	5,253	3,455	20,810	13,964	4,955
Suffolk County	2,818	180	5,772	56,475	50,568	24,496	84,785	36,697	19,732
Total for NY Counties	7,279	835	24,658	270,520	197,958	120,312	441,522	266,778	185,075
New Jersey Counties									
Atlantic County	534	58	1,055	8,250	5,936	2,695	14,744	4,503	1,466
Burlington County	750	101	1,895	12,152	17,183	6,989	26,058	10,581	5,004
Camden County	452	40	1,708	14,335	17,795	8,318	30,522	13,354	4,744
Cape May County	375	49	456	4,029	1,219	1,105	4,367	1,189	476
Cumberland County	2,343	123	759	4,030	7,800	2,570	7,621	2,597	612
Essex County	495	75	1,648	23,000	24,863	9,623	36,756	28,211	10,910
Gloucester County	695	133	1,776	10,008	10,933	5,382	17,570	7,305	2,928
Hudson County	245	51	1,014	18,301	24,648	12,718	35,716	26,809	11,795
Middlesex County	433	119	2,988	20,534	36,696	15,315	41,737	28,798	11,543
Monmouth County	893	58	2,772	22,763	18,829	9,382	35,343	12,021	10,974
Ocean County	601	74	3,678	21,245	13,543	7,382	35,419	9,932	4,977
Salem County	560	22	1,248	2,409	3,352	1,155	2,935	1,777	300
Union County	252	123	2,058	16,633	24,984	9,457	28,899	24,525	6,717
Total for NJ Counties	8628	1026	23,055	177,689	207,781	92,091	317,687	171,602	72,446

Source: U.S. Census Bureau 2019.

Table B.4-7. At place employment by industry (2019), continued

	Finance, Insurance, Real Estate	Professional, Scientific, Technical	Management of Companies	Admin, Support, Waste Management	Education, Health Care, Social Assist	Arts/ Entertainment / Recreation	Accommodations and Food	Total
New York Counties								
Albany County	12,415	13,789	149	4,912	44,307	3,191	11,491	133,477
Kings County	91,338	125,666	1,229	46,616	348,257	37,893	85,916	1,117,476
Nassau County	72,230	64,370	770	23,699	199,351	14,672	33,485	626,658
New York County	147,662	156,125	1,654	27,466	208,232	41,370	55,565	844,083
Queens County	74,244	64,154	708	33,484	196,735	13,678	73,420	747,573
Rensselaer County	4,744	6,157	90	2,328	21,749	1,365	5,234	69,241
Richmond County	20,507	15,464	162	9,215	63,882	4,002	10,999	191,047
Suffolk County	51,970	57,882	576	30,365	206,220	15,153	38,811	682,500
Total for NY Counties	475,110	503,607	5,338	178,085	1,288,733	131,324	314,921	4,412,055
New Jersey Counties								
Atlantic County	534	58	1,055	8,250	5,936	2,695	14,744	4,503
Burlington County	750	101	1,895	12,152	17,183	6,989	26,058	10,581
Camden County	452	40	1,708	14,335	17,795	8,318	30,522	13,354
Cape May County	375	49	456	4,029	1,219	1,105	4,367	1,189
Cumberland County	2,343	123	759	4,030	7,800	2,570	7,621	2,597
Essex County	495	75	1,648	23,000	24,863	9,623	36,756	28,211
Gloucester County	695	133	1,776	10,008	10,933	5,382	17,570	7,305
Hudson County	245	51	1,014	18,301	24,648	12,718	35,716	26,809
Middlesex County	433	119	2,988	20,534	36,696	15,315	41,737	28,798

	Finance, Insurance, Real Estate	Professional, Scientific, Technical	Management of Companies	Admin, Support, Waste Management	Education, Health Care, Social Assist	Arts/ Entertainment / Recreation	Accommodations and Food	Total
Monmouth County	893	58	2,772	22,763	18,829	9,382	35,343	12,021
Ocean County	601	74	3,678	21,245	13,543	7,382	35,419	9,932
Salem County	560	22	1,248	2,409	3,352	1,155	2,935	1,777
Union County	252	123	2,058	16,633	24,984	9,457	28,899	24,525
Total NJ Counties	8,628	1,026	23,055	177,689	207,781	92,091	317,687	171,602

Source: U.S. Census Bureau 2019.

Table B.4-8. Ocean economy employment, New York, and New Jersey Counties (2019)

Jurisdiction	Marine Construction	Living Resources	Offshore Mineral Extraction	Ship and Boat Building	Tourism and Recreation	Marine Transportation	Total, All Sectors
New York Counties							
Albany County	Suppressed*	Suppressed*	Suppressed*	Suppressed*	0	535	535
Kings County	107	1,398	Suppressed*	Suppressed*	33,716	1,525	36,746
Nassau County	327	503	32	Suppressed*	17,328	2,387	20,577
New York County	827	560	Suppressed*	Suppressed*	218,880	117	220,384
Queens County	495	332	34	0	11,469	2,524	14,854
Rensselaer County	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Richmond County	149	77	0	190	7,397	275	8,088
Suffolk County	688	594	24	Suppressed*	36,614	3,631	41,398
Total for NY Counties	2593	3464	90	190	325,404	10459	342,047
New Jersey Counties							
Atlantic County	Suppressed*	16	Suppressed*	Suppressed*	11,017	85	11,254
Burlington County	Suppressed*	13	Suppressed*	Suppressed*	0	5,942	11,375
Camden County	85	11	Suppressed*	0	1,062	2133	4,168
Cape May County	100	112	Suppressed*	Suppressed*	10,407	62	11,139
Cumberland County	Suppressed	271	Suppressed*	Suppressed*	1,253	839	2,665
Essex County	333	339	Suppressed*	Suppressed*	5,218	2,266	8,476
Gloucester County	314	Suppressed*	Suppressed*	Suppressed*	1,522	6,384	8,293

Jurisdiction	Marine Construction	Living Resources	Offshore Mineral Extraction	Ship and Boat Building	Tourism and Recreation	Marine Transportation	Total, All Sectors
Hudson County	41	150	Suppressed*	Suppressed*	17,113	4,666	22,652
Middlesex County	104	Suppressed*	Suppressed*	Suppressed*	1,445	19,670	21,581
Monmouth County	113	109	Suppressed*	0	18,483	280	19,042
Ocean County	213	148	Suppressed*	Suppressed*	14,597	38	15,342
Salem County	0	Suppressed*	0	0	716	1,226	1,955
Union County	945	16	Suppressed*	Suppressed*	3,414	4,253	11,707
Total for NJ Counties	2248	1185	0	0	86,247	47844	149,649

Source: NOEP 2022
*"Suppressed" data are those that, although included in summation data, NOAA is withholding because there are few enough respondents in a data category for it to be possible to extract personally (or corporate/ business) identifiable data, e.g., if there is only one marine construction firm in a county, its revenue/employment data is not included in the county total but is included in the state total.

Table B.4-9. Total number of establishments, employment, wages, and GDP for ocean industry economy, by county (2019)

Ocean Sector	Establishments	Employment	Wages, $ millions	GDP, millions	% GDP of NY Coastal Ocean Sector	
					Wages	GDP
New York Counties						
Albany County	37	535	$22	$30	0.2%	0.1%
Bronx County	763	7,095	$214	$417	1.5%	1.3%
Kings County	3,969	36,746	$1,091	$2,319	7.8%	7.4%
Nassau County	1,570	20,577	$636	$1,156	4.5%	3.7%
New York County	9,624	220,384	$9,999	$23,464	71.2%	74.9%
Queens County	1,572	14,854	$472	$822	3.4%	2.6%
Richmond County	891	8,088	$243	$471	1.7%	1.5%
Suffolk County	3,019	41,398	$1,371	$2,651	10%	8.5%
All Ocean Sectors, County	21,445	349,677	$14,047	$31,330	100%	100%
All Ocean Sectors, State	24,019	398,514	$16,111	$35,109	87%	89%
New Jersey Counties						
Atlantic County	651	11,118	$293	$583	7.9%	8.9%
Cape May County	1,052	10,681	$281	$568	7.6%	8.6%
Essex County	558	8,156	$407	$712	11%	11%
Hudson County	1,532	21,970	$686	$1,242	18%	19%

Ocean Sector	Establishments	Employment	Wages, $ millions	GDP, millions	% GDP of NY Coastal Ocean Sector	
					Wages	GDP
Middlesex County	369	21,219	$899	$1,340	24%	20%
Monmouth County	1,403	19,005	$438	$832	12%	13%
Ocean County	1,250	14,996	$332	$659	9%	10%
Union County	405	8,628	$375	$646	10%	10%
All Ocean Sectors, County	7,220	115,773	$3,711	$6,582	100%	100%
All Ocean Sectors, State	9,349	169,654	$6,689	$11,857	55%	56%

Source: NOAA 2022.

B.5 Environmental Justice

The following subsections describe demographic, economic, environmental, and social characteristics for each of the counties in the geographic analysis area exceeding environmental justice thresholds as identified in Section 3.6.4, *Environmental Justice*.

B.5.1 Atlantic County, New Jersey

Atlantic County has a population of 265,000 residents with 45 percent of the population identifying as minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary language (DataUSA 2023a). This information does not reflect that households may have multi-lingual residents or limited English proficiency. Rather, it is the self-reported language spoken by all members of the household.

The median property value in the county was $216,600 and the homeownership rate was 67 percent. The Atlantic County economy employs 125,000 people with the largest industries being health care and social assistance, accommodation and food service, and retail trade. Relevant to ports or offshore wind services, the employment sectors reported for residents of Atlantic County are 6.3 percent in construction, 4.5 percent in manufacturing, and 3.6 percent in transportation and warehousing (DataUSA 2023a).

The largest demographic living in poverty in Atlantic County is females aged 25–34, followed by females 18–24, and females 55–64. The most common race living below the poverty line is White, followed by Hispanic, and then Black. Of children living in Atlantic County in 2021, 15.4 percent were living in poverty, with the rate decreasing over time since 2015 (DataUSA 2023a). Atlantic County has one of the highest percentages of children in New Jersey under 5 years of age living in poverty (New Jersey Department of Health 2023). Food insecurity also has trended downward with 11 percent of the population reported as food insecure in 2021. This is a 5 percent reduction from 2015 (DataUSA 2023a). In 2020, Atlantic County reported a hospitalization rate for asthma of 5.2 cases per 10,000 county residents compared to the state average of 3.8 cases (New Jersey Department of Health 2023).

Table B.5-1. Atlantic County environmental indicators

Selected variables	Value	State Average	Percentile In State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m3)	7.03	8.05	11	8.08	21
Ozone (ppb)	61	63.9	6	61.6	49
Diesel Particulate Matter* (µg/m3)	0.158	0.414	7	0.261	33
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	1	25	5
Air Toxics Respiratory HI*	0.21	0.33	0	0.31	4
Toxic Releases to Air	5	1,100	5	4,600	7
Traffic Proximity (daily traffic count/distance to road)	110	210	50	210	60

Selected variables	Value	State Average	Percentile In State	USA Average	Percentile in USA
Lead Paint (% Pre-1960 Housing)	0.31	0.44	37	0.3	59
Superfund Proximity (site count/km distance)	0.29	0.45	61	0.13	90
RMP Facility Proximity (facility count/km distance)	0.026	0.3	3	0.43	3
Hazardous Waste Proximity (facility count/km distance)	0.17	2.8	14	1.9	31
Underground Storage Tanks (count/km2)	6.9	15	47	3.9	83
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.00027	0.045	29	22	37

Source: USEPA 2024a.

B.5.2 Camden County, New Jersey

Camden County has a population of 507,000 people with 47 percent identifying as minority in 2020 (US Census Bureau 2020). All households reported English as their primary language (DataUSA 2023b). The median property value in the county was $204,400 and the homeownership rate was 66 percent. More residents drive alone or carpool than take public transportation. Only 6.6 percent rely on public transportation and overall resident commutes average 29 minutes (DataUSA 2023b). The Camden County economy employs 249,000 people with the largest employment for residents being management, education instruction and library, and business and financial operations. Relevant to ports or offshore wind services, the employment sectors reported for residents of Camden County are 4.3 percent in transportation and 4.2 percent in construction and extraction (DataUSA 2023b). The employment rate for Camden County residents declined less than 1 percent from 2019 to 2020 (DataUSA 2023b).

The largest demographic living in poverty in Camden County is females aged 25–34, followed by females 35–44, and females 45–54. The most common race living below the poverty line is White, followed by Hispanic, and then Black. Of children living in Camden County in 2021, 15.3 percent were living in poverty with the rate having decreased slowly from 22 percent since 2015 (DataUSA 2023b). Food insecurity is currently an issue for 10.3 percent of the population, down from over 14 percent in 2015 (DataUSA 2023b). In 2020, Camden County reported a hospitalization rate for asthma of 7.6 cases per 10,000 county residents, double the state average of 3.8 cases (New Jersey Department of Health 2023).

Table B.5-2. Camden County environmental indicators

Selected variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	8.29	8.05	57	8.08	52
Ozone (ppb)	66.9	63.9	91	61.6	84
Diesel Particulate Matter (µg/m^3)	0.344	0.414	46	0.261	76
Air Toxics Cancer Risk* (lifetime risk per million)	28	27	1	25	5
Air Toxics Respiratory HI*	0.33	0.33	12	0.31	31

Selected variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Toxic Releases to Air	1,200	1,100	76	4,600	62
Traffic Proximity (daily traffic count/distance to road)	200	210	69	210	74
Lead Paint (% Pre-1960 Housing)	0.41	0.44	46	0.3	67
Superfund Proximity (site count/km distance)	0.57	0.45	75	0.13	95
RMP Facility Proximity (facility count/km distance)	0.25	0.3	76	0.43	63
Hazardous Waste Proximity (facility count/km distance)	2	2.8	57	1.9	74
Underground Storage Tanks (count/km^2)	8.4	15	52	3.9	86
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0081	0.045	66	22	66

Source: USEPA 2024b.

B.5.3 Cumberland County, New Jersey

Cumberland County has a population of 150,000 people with 57 percent identifying as minority in 2020 (US Census Bureau 2020). All households reported English as their primary language (DataUSA 2023c). The median property value in the county was $166,400 and the homeownership rate was 66 percent. The Camden County economy employs 60,400 people with the largest employment for residents being office and administrative support services, sales and related occupations, and production occupations. Relevant to ports or offshore wind services, the employment sectors reported for residents of Cumberland County are 6.0 percent in construction and extraction occupations and 4.9 percent in transportation (DataUSA 2023c). The employment rate for Cumberland County residents declined nearly 2 percent from 2019 to 2020 (DataUSA 2023c).

In Cumberland County, 16 percent of the population lives below the poverty line. The largest demographic living in poverty is females aged 25–34, followed by females 45–54, and females 35–44. The most common race living below the poverty line is White, followed by Hispanic, and then Black. Of children living in Cumberland County in 2021, 19.5 percent were living in poverty with the rate having decreased slowly from 25 percent since 2014 (DataUSA 2023c). Food insecurity is currently an issue for 12.6 percent of the population (DataUSA 2023c). In 2020, Cumberland County reported a hospitalization rate for asthma of 9.2 cases per 10,000 county residents. This is the highest county rate in the state and is more than double the state average (New Jersey Department of Health 2023).

Table B.5-3. Cumberland County environmental indicators

Selected variables	Value	State Average	Percentile in state	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	7.49	8.05	20	8.08	32
Ozone (ppb)	63.9	63.9	54	61.6	69
Diesel Particulate Matter (µg/m^3)	0.169	0.414	9	0.261	37

Selected variables	Value	State Average	Percentile in state	USA Average	Percentile in USA
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	0	25	1
Air Toxics Respiratory HI*	0.27	0.33	0	0.31	4
Toxic Releases to Air	530	1,100	25	4,600	47
Traffic Proximity (daily traffic count/distance to road)	55	210	28	210	42
Lead Paint (% Pre-1960 Housing)	0.41	0.44	46	0.3	67
Superfund Proximity (site count/km distance)	0.51	0.45	72	0.13	95
RMP Facility Proximity (facility count/km distance)	0.16	0.3	58	0.43	49
Hazardous Waste Proximity (facility count/km distance)	0.37	2.8	27	1.9	45
Underground Storage Tanks (count/km^2)	5.7	15	43	3.9	80
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0012	0.045	43	22	50

Source: USEPA 2024c.

B.5.4 Essex County, New Jersey

Essex County is the third-most populous and second-most densely populated county in New Jersey. The county also has the most Black or African Americans within its boundaries (New Jersey Department of Children and Families 2020). Essex County has a population of 799,000 residents with 72.8 percent of the population identifying as minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary shared language (DataUSA 2022a). The median property value in the county was $395,900 and the homeowner rate was 44 percent. Over 20 percent of the population relies on public transportation with resident commute times averaging 35 minutes (DataUSA 2022a). The Essex County economy employs 380,000 people with the largest industries being health care and social assistance, retail trade, and educational services. Relevant to ports or offshore wind services, the employment sectors reported for residents of Essex County are 7.4 percent in transportation and warehousing, 6.7 percent in manufacturing, and 6.0 percent in construction (DataUSA 2022a). The employment rate for Essex County grew less than 0.5 percent from 2019 to 2020 (DataUSA 2022a). The wealth of the county is not evenly distributed, with the majority of low-income residents residing in the east, closest to the ports.

In Essex County 15 percent of the population lives in poverty. The largest community within the county, the City of Newark, has over a 35 percent poverty rate and has one of the highest homeless rates in the state (New Jersey Department of Health 2023). The largest demographic living in poverty is females aged 25–34, followed by females 35–44, and females 45–54. The most common race living below the poverty line is Black, followed by Hispanic, and then White. Of children living in Essex County in 2021, 18.4 percent were living in poverty with the rate having decreased slowly from 25 percent since 2015 (DataUSA 2022a). Essex County has one of the highest percentages of children in New Jersey under 5 years of age living in poverty (NJ Dept of Health 2023). In 2020, Essex County reported a hospitalization rate for asthma of 6.7 cases per 10,000 county residents compared to the state average of 3.8 cases (New Jersey Department of Health 2023). Food insecurity is currently an issue for 12.7 percent of the population, down from nearly 20 percent in 2014 (DataUSA 2022a).

Table B.5-4. Essex environmental indicators

Selected Variables	Value	State Average	Percentile in State	USA Average	Percentile In USA
Pollution and Sources					
Particulate Matter (µg/m^3)	8.61	8.05	75	8.08	62
Ozone (ppb)	62.9	63.9	20	61.6	62
Diesel Particulate Matter (µg/m^3)	0.584	0.414	76	0.261	94
Air Toxics Cancer Risk* (lifetime risk per million)	30	27	33	25	52
Air Toxics Respiratory HI*	0.4	0.33	12	0.31	31
Toxic Releases to Air	1,100	1,100	72	4,600	61
Traffic Proximity (daily traffic count/distance to road)	350	210	84	210	86
Lead Paint (% Pre-1960 Housing)	0.55	0.44	61	0.3	77
Superfund Proximity (site count/km distance)	0.84	0.45	84	0.13	97
RMP Facility Proximity (facility count/km distance)	0.26	0.3	77	0.43	64
Hazardous Waste Proximity (facility count/km distance)	3.5	2.8	68	1.9	83
Underground Storage Tanks (count/km^2)	32	15	83	3.9	98
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.019	0.045	80	22	72

Source: USEPA 2024d.

B.5.5 Hudson County, New Jersey

Hudson County is the most densely populated county in New Jersey with a population of 672,000 people with 71.5 percent identifying as minority in 2020 (US Census Bureau 2020). All households reported English as their primary language (DataUSA 2023d). The median property value in the county was $400,800 and the homeownership rate was 32 percent. Nearly 40 percent of residents use public transportation to get to work, with an average commute time of 36 minutes. The Hudson County economy employs 360,000 people with the largest employment for residents being management occupations, office and administrative support services, and sales and related occupations. Relevant to ports or offshore wind services, the employment sectors reported for residents of Hudson County are 6.0 percent in transportation and 4 percent in construction and extraction occupations (DataUSA 2023d). The employment rate for Hudson County residents grew almost 1 percent from 2019 to 2020 (DataUSA 2023d).

In Hudson County 14 percent of the population lives in poverty. The largest demographic living in poverty is females aged 25–34, followed by females 35–44, and males 25–34. The most common race living below the poverty line is Hispanic, followed by White, and then Other. Of children living in Hudson County in 2021, 20 percent were living in poverty with the rate having decreased slowly from 30 percent since 2015 (DataUSA 2023d). Food insecurity was an issue for 12.5 percent of the population in 2017 (DataUSA 2023d). In 2020, Hudson County reported a hospitalization rate for asthma of 3.8 cases per 10,000 county residents, the same as the state average (New Jersey Department of Health 2023).

Table B.5-5. Hudson County environmental indicators

Selected variables	Value	State Average	Percentile In State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	8.83	8.05	91	8.08	69
Ozone (ppb)	63.6	63.9	45	61.6	67
Diesel Particulate Matter (µg/m^3)	0.841	0.414	95	0.261	97
Air Toxics Cancer Risk* (lifetime risk per million)	30	27	33	25	52
Air Toxics Respiratory HI*	0.43	0.33	61	0.31	70
Toxic Releases to Air	920	1,100	56	4,600	58
Traffic Proximity (daily traffic count/distance to road)	370	210	84	210	86
Lead Paint (% Pre-1960 Housing)	0.48	0.44	54	0.3	72
Superfund Proximity (site count/km distance)	0.72	0.45	80	0.13	96
RMP Facility Proximity (facility count/km distance)	0.69	0.3	88	0.43	82
Hazardous Waste Proximity (facility count/km distance)	9	2.8	93	1.9	95
Underground Storage Tanks (count/km^2)	43	15	90	3.9	99
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.018	0.045	79	22	72

Source: USEPA 2024e.

B.5.6 Middlesex County, New Jersey

Middlesex County has a population of 863,000 residents with over 61 percent of the population identifying as minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary shared language (DataUSA 2022b). The median property value was $351,400 and the homeownership rate was 34 percent. Only 9.2 percent of residents rely on public transportation to get to their place of work and average commutes for residents are 34 minutes. Over 7 percent have “super commutes,” which are commutes over 90 minutes (DataUSA 2022b). The Middlesex County economy employs 408,000 people with the largest industries being health care and social assistance; professional, scientific, and technical services; and retail trade. Relevant to ports or offshore wind services, the employment sectors reported for residents of Essex County are 8.7 percent in manufacturing, 7.4 percent in transportation and warehousing, and 5.1 percent in construction (DataUSA 2022b). The employment rate in Middlesex County rose 0.3 percent from 2019 to 2020.

In Middlesex County 8.7 percent of the population lives in poverty. The largest demographic living in poverty is females aged 25–34, followed by males 18–24, and females 35–44. The most common race living below the poverty line is White, followed by Hispanic, and then Asian. Of children living in Middlesex County in 2021, 11 percent were living in poverty with the rate having decreased slowly from

13 percent since 2014 (DataUSA 2022b). Food insecurity was an issue for 9.6 percent of the population in 2017 (DataUSA 2022b). In 2020, Middlesex County reported a hospitalization rate for asthma of 3.1 cases per 10,000 county residents, which is below the state average (New Jersey Department of Health 2023).

Table B.5-6. Middlesex County environmental indicators

Selected variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	7.89	8.05	37	8.08	42
Ozone (ppb)	64.6	63.9	68	61.6	73
Diesel Particulate Matter (µg/m^3)	0.424	0.414	58	0.261	86
Air Toxics Cancer Risk* (lifetime risk per million)	33	27	33	25	52
Air Toxics Respiratory HI*	0.33	0.33	12	0.31	31
Toxic Releases to Air	1,500	1,100	86	4,600	67
Traffic Proximity (daily traffic count/distance to road)	220	210	71	210	76
Lead Paint (% Pre-1960 Housing)	0.33	0.44	38	0.3	60
Superfund Proximity (site count/km distance)	0.58	0.45	76	0.13	95
RMP Facility Proximity (facility count/km distance)	0.46	0.3	83	0.43	75
Hazardous Waste Proximity (facility count/km distance)	4	2.8	72	1.9	85
Underground Storage Tanks (count/km^2)	10	15	57	3.9	89
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.059	0.045	91	22	79

Source: USEPA 2024f.

B.5.7 Union County, New Jersey

Union County has a population of 555,200 residents with over 63 percent of the population identifying as minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary shared language (DataUSA 2023e). The median property value was $378,700 and the homeownership rate was 59 percent. Over 11 percent of residents rely on public transportation to get to their place of work and average commutes for residents are 31 minutes. Nearly 5 percent have “super commutes,” which are commutes over 90 minutes (DataUSA 2023e). The Union County economy employs 283,000 people with the largest industries being health care and social assistance, retail trade, and transportation and warehousing. Relevant to ports or offshore wind services, the employment sectors reported for residents of Union County are 5.9 percent in transportation occupations, 4.9 percent in construction and extraction occupations, and 4.6 percent in production occupations (DataUSA 2023e). The employment rate in Union County rose 0.3 percent from 2019 to 2020.

In Union County 8.8 percent of the population lives in poverty. The largest demographic living in poverty is females aged 25–34, followed by females 35-44, and females 55–64. The most common race living below the poverty line is Hispanic, followed by White, and then Black. Of children living in Union County in 2021, 12 percent were living in poverty. This rate is an increase from 11 percent in 2020 and a decrease from a high of 16 percent in 2014 (DataUSA 2023e). Food insecurity was an issue for 11.4 percent of the population in 2017 (DataUSA 2023e). In 2020, Union County reported a hospitalization rate for asthma of 3.6 cases per 10,000 county residents, which is below the state average (New Jersey Department of Health 2023).

Table B.5-7. Union County environmental indicators

Selected Variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	8.32	8.05	59	8.08	53
Ozone (ppb)	63.2	63.9	33	61.6	64
Diesel Particulate Matter (µg/m^3)	0.526	0.414	68	0.261	92
Air Toxics Cancer Risk* (lifetime risk per million)	31	27	33	25	52
Air Toxics Respiratory HI*	0.36	0.33	12	0.31	31
Toxic Releases to Air	1,500	1,100	85	4,600	66
Traffic Proximity (daily traffic count/distance to road)	280	210	78	210	81
Lead Paint (% Pre-1960 Housing)	0.6	0.44	67	0.3	80
Superfund Proximity (site count/km distance)	0.31	0.45	63	0.13	91
RMP Facility Proximity (facility count/km distance)	0.56	0.3	86	0.43	78
Hazardous Waste Proximity (facility count/km distance)	4.7	2.8	76	1.9	88
Underground Storage Tanks (count/km^2)	20	15	73	3.9	96
Wastewater Discharge toxicity-weighted concentration/m distance)	0.039	0.045	88	22	77

Source: USEPA 2024g.

B.5.8 Kings County, New York

Kings County has a population of 2.6 million residents with 64 percent of the population identified as minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary shared language (DataUSA 2022c). The median property value in Kings County was $734,800 and the homeownership rate was 30 percent. Most residents travel by public transit to work (58 percent) with an overall county average commute time of 43 minutes. The Kings County economy employs 1.22 million people with the largest industries being health care and social assistance; professional, scientific, and technical services; and educational services. Relevant to ports or offshore wind services, the employment sectors reported for residents of Kings County are 6.3 percent in transportation and warehousing, 4.9 percent in construction, and 3.9 percent in manufacturing (DataUSA 2022c). The employment rate in Kings County declined 0.8 percent from 2019 to 2020.

In Kings County 19 percent of the population lives in poverty. The largest demographic living in poverty is females aged 25–34, followed by females 35–44, and males 25–34. The most common race living below the poverty line is White, followed by Black, and then Hispanic. Of children living in Kings County in 2021, 25 percent were living in poverty. This rate is a decrease from 34 percent in 2014 (DataUSA

2022c). Food insecurity was an issue for 14 percent of the population in 2017, the second-highest rate in New York (DataUSA 2022c). For 2017–2019, Kings County reported a hospitalization rate for asthma of 12.6 cases per 10,000 county residents, which is above the state average of 10.2 (New York State Department of Health 2023).

Table B.5-8. Kings County environmental indicators

Selected Variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	8.42	7.71	70	8.08	56
Ozone (ppb)	63.9	62.6	49	61.6	69
Diesel Particulate Matte (µg/m^3)	1.05	0.525	84	0.261	98
Air Toxics Cancer Risk* (lifetime risk per million)	30	25	54	25	52
Air Toxics Respiratory HI*	0.49	0.33	57	0.31	70
Toxic Releases to Air	420	450	75	4,600	43
Traffic Proximity (daily traffic count/distance to road)	630	430	80	210	92
Lead Paint (% Pre-1960 Housing)	0.69	0.55	60	0.3	85
Superfund Proximity (site count/km distance)	0.51	0.24	88	0.13	94
RMP Facility Proximity (facility count/km distance)	0.086	0.21	40	0.43	24
Hazardous Waste Proximity (facility count/km distance)	7.4	4.3	81	1.9	93
Underground Storage Tanks (count/km^2)	16	7.7	81	3.9	94
Wastewater Discharge (toxicity-weighted concentration/m distance)	7.8	5	87	22	96

Source: USEPA 2024h.

B.5.9 New York County, New York

New York County has a population of 1.6 million residents with 53 percent of the population identified as minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary shared language (DataUSA 2023f). The median property value in New York County was $1.2 million and the homeownership rate was 24 percent. Most residents travel by public transit to work (55 percent) with an overall county average commute time of 32 minutes. The New York County economy employs 894,000 people with the largest industries being professional, scientific, and technical services; health care and social assistance; and financial and insurance occupations. Relevant to ports or offshore wind services, the employment sectors reported for residents of New York County are only 1.8 percent in transportation occupations, and 1.3 percent in production (DataUSA 2023f). The employment rate in New York County declined 1.25 percent from 2019 to 2020.

In New York County 16 percent of the population lives in poverty. The largest demographic living in poverty is females aged 25–34, followed by females 18–24, and females 55–64. The most common race living below the poverty line is Hispanic, followed by White, and then Black. Of children living in New

York County in 2021, 17 percent were living in poverty, a decrease from 27 percent in 2014 (DataUSA 2023f). Food insecurity was an issue for 15 percent of the population in 2017 (DataUSA 2023f). For 2017–2019, New York County reported a hospitalization rate for asthma of 12.5 cases per 10,000 county residents, which is above the state average of 10.2 (New York State Department of Health 2023).

Table B.5-9. New York County environmental indicators

Selected Variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter ($\mu g/m^3$)	8.89	7.71	93	8.08	70
Ozone (ppb)	65.1	62.6	60	61.6	75
Diesel Particulate Matter ($\mu g/m^3$)	1.11	0.525	88	0.261	99
Air Toxics Cancer Risk* (lifetime risk per million)	35	25	54	25	52
Air Toxics Respiratory HI*	0.51	0.33	73	0.31	92
Toxic Releases to Air	470	450	80	4,600	45
Traffic Proximity (daily traffic count/distance to road)	1,100	430	89	210	96
Lead Paint (% Pre-1960 Housing)	0.59	0.55	50	0.3	79
Superfund Proximity (site count/km distance)	0.29	0.24	80	0.13	90
RMP Facility Proximity (facility count/km distance)	0.11	0.21	58	0.43	34
Hazardous Waste Proximity (facility count/km distance)	16	4.3	94	1.9	98
Underground Storage Tanks (count/km^2)	21	7.7	88	3.9	96
Wastewater Discharge (toxicity-weighted concentration/m distance)	18	5	92	22	97

Source: USEPA 2024i.

B.5.10 Queens County, New York

Queens County has a population of 2.4 million residents with over 77 percent of the population identified as a minority in 2020 (U.S. Census Bureau 2020). All households reported English as their primary shared language. The median property value in Queens County was $575,600 and the homeownership rate was 45 percent (DataUSA 2022d). Most residents (48 percent) travel by public transit to work with an average commute time of 44 minutes for all county residents. The economy of Queens County employs 1.12 million people with the largest industries being health care and social assistance; retail trade, and accommodation and food services. Relevant to ports or offshore wind services, the employment sectors reported for residents of Queens County are 8.1 percent in transportation and warehousing, 7.3 percent in construction, and 3.4 percent in manufacturing (DataUSA 2022d).

In Queens County 12 percent of the population lives in poverty. The largest demographic living in poverty is females aged 25–34, followed by females 35–44, and females 55–64. The most common race living below the poverty line is Hispanic, followed by White, and then Asian. Of children living in Queens County in 2021, 14 percent were living in poverty, a decrease from 24 percent in 2014 (DataUSA 2022d). Food insecurity was an issue for 13 percent of the population in 2017 (DataUSA 2022d). For 2017–2019, Queens County reported a hospitalization rate for asthma of 11.6 cases per 10,000 county residents, which is above the state average of 10.2 (New York State Department of Health 2023).

Table B.5-10. Queens County environmental indicators

Selected Variables	Value	State Average	Percentile in State	USA Average	Percentile in USA
Pollution and Sources					
Particulate Matter (µg/m^3)	8.21	7.71	62	8.08	50
Ozone (ppb)	66.7	62.6	72	61.6	84
Diesel Particulate Matter (µg/m^3)	0.881	0.525	72	0.261	97
Air Toxics Cancer Risk* (lifetime risk per million)	31	25	54	25	52
Air Toxics Respiratory HI*	0.44	0.33	57	0.31	70
Toxic Releases to Air	230	450	46	4,600	34
Traffic Proximity (daily traffic count/distance to road)	740	430	83	210	94
Lead Paint (% Pre-1960 Housing)	0.66	0.55	57	0.3	83
Superfund Proximity (site count/km distance)	0.28	0.24	80	0.13	90
RMP Facility Proximity (facility count/km distance)	0.055	0.21	17	0.43	12
Hazardous Waste Proximity (facility count/km distance)	5.9	4.3	76	1.9	91
Underground Storage Tanks (count/km^2)	15	7.7	78	3.9	93
Wastewater Discharge (toxicity-weighted concentration/m distance)	19	5	92	22	97

Source: USEPA 2024j.

B.6 Recreation and Tourism

The following subsections characterize recreational resources within each county in the recreation and tourism geographic analysis area.

B.6.1 Kings County, New York

Kings County comprises a total of 97 square miles (250 square kilometers), of which 71 square miles (183 square kilometers) are land and 26 square miles (67 square kilometers) are water. Kings County is located at the far western tip of Long Island and contains the New York City borough of Brooklyn. Kings County has 10 nature preserves and parks (New York City Department of Parks and Recreation 2023; New York State Office of Parks, Recreation and Historic Preservation 2023) that include the Brooklyn Botanic Garden; Prospect Park; Coney Island; Floyd Bennett Field and Jamaica Bay Wildlife Refuge, which are shared with Queens County; and the first municipal airport in New York City that is now part of the National Park System. There are seven marinas serving Kings County (New York City Department of Parks and Recreation 2023), with one county-operated marina.

There were 3,720 tourism and recreation establishments in the county that supported just under 34,000 employees in 2019. Tourism and recreation generated just under $980 million in annual payroll and provided the state with a GDP of $2,081,896,633 (NOEP 2022).

B.6.2 Queens County, New York

Queens County comprises a total of 178 square miles (460 square kilometers), of which 108 square miles (280 square kilometers) are land and 70 square miles (180 square kilometers) are water. Queens County has numerous parks and recreation areas (New York City Department of Parks and Recreation 2023), including national parks (Breezy Point, Canarsie Pier, Floyd Bennett Field, Fort Tilden, Jacob Riis Park, and the Jamaica Bay Wildlife Refuge) and State of New York Parks (Bayswater Point State Park and Gantry Plaza State Park). There are two marinas serving Queens County (New York City Department of Parks and Recreation 2023), with one marina operated by the county.

There were 1,390 tourism and recreation establishments in the county that supported just under nearly 12,000 employees in 2019. Tourism and recreation generated just under $235 million in annual payroll and provided the state with a GDP of $545,211,625 (NOEP 2022).

B.6.3 Richmond County, New York

Richmond County, better known as Staten Island, comprises a total of 103 square miles (265 square kilometers), of which 59 square miles (152 square kilometers) are land and 44 square miles (114 square kilometers) are water. Staten Island is home to 24 nature preserves, of which 22 have freshwater wetland or salt marsh habitat (New York City Department of Parks and Recreation 2023). There are two marinas serving Richmond County (New York City Department of Parks and Recreation 2023), with one county-operated marina. The East Shore of Staten Island is home to the 2.5-mile F.D.R. Boardwalk, the fourth-longest in the world.

There were 846 tourism and recreation establishments in the county that supported just under 7,397 employees in 2019. Tourism and recreation generated nearly $179 million in annual payroll and provided the state with a GDP just over $360 million (NOEP 2022).

B.6.4 Suffolk County, New York

Suffolk County encompasses 2,373 square miles (6,150 square kilometers)—of which 912 square miles (2,360 square kilometers) are land and 1,461 square miles (3,780 square kilometers) are water—and has about 1,000 miles of coastline. Recreational areas in Suffolk County include national wildlife refuges, national seashore, state parks and forests, and tidal wetland areas. Notable coastal recreational resources include Montauk Point State Park, Robert Moses State Park, Captree State Park, Fire Island National Seashore, and Gilgo State Park. Suffolk County has the most lighthouses of any county in the United States, and includes the Fire Island Lighthouse, which was an important landmark for trans-Atlantic ships entering the New York Harbor in the early 20th century. Captree State Park, located on the eastern tip of Jones Island, is home to the largest public fishing fleet on Long Island. Open and charter boats are available for saltwater fishing, sightseeing excursions, and scuba diving trips. Popular spots for surf fishing in Suffolk County include Camp Hero State Park and Montauk Point State Park (New York State Office of Parks, Recreation and Historic Preservation 2023). The Suffolk County Parks Department has several full-service watercraft facilities, including four marinas and two boat ramps/launches. There are dozens of marinas serving Suffolk County (CountyOffice.org 2023a).

There were 4,016 accommodation and food service establishments in the county in 2019. Together, these generated over $1.3 billion in annual payroll. There were 937 arts, entertainment, and recreation establishments in Suffolk County, which bring in approximately $354 million in annual payroll (U.S. Census Bureau 2021a, 2021b).

B.6.5 Nassau County, New York

Nassau County comprises a total of 453 square miles (1,174 square kilometers), of which 285 square miles (737 square kilometers) are land and 168 square miles (436 square kilometers) are water. Nassau County is a densely populated county on western Long Island. Recreational areas include Bethpage State Park, Hempstead Lake State Park, Oyster Bay National Wildlife Refuge, Lido Beach Wildlife Management Area, and Jones Beach State Park. Jones Beach State Park is one of the most heavily visited beaches on the East Coast, with an estimated 8.5 million visitors in 2018 (New York State Office of Parks, Recreation and Historic Preservation 2022). Visitors to Jones Beach can swim; enjoy the boardwalk; fish; dine; visit the WildPlay Adventure Park; play miniature golf, shuffleboard, basketball, corn hole, paddle tennis, table tennis, and pickleball; and attend concerts at Northwell Health Theatre. For recreational fishing, Jones Beach offers fishing piers, a bait and tackle shop, and a boat basin that allows boaters day use of the park throughout the boating season. The county operates boat launches at four county parks (Nassau County 2023).

There were 3,812 accommodation and food service establishments in the county in 2019. Together, these generated over $1.3 billion in annual payroll. There were 928 arts, entertainment, and recreation establishments in Nassau County, which bring in approximately $559 million in annual payroll (U.S. Census Bureau 2021a, 2021b).

B.6.6 Monmouth County, New Jersey

Monmouth County encompasses 472 square miles (1,223 square kilometers) of land, including 27 miles (44 kilometers) of Atlantic coastline and 26 miles (42 kilometers) of Raritan Bay coastline. There are 30 parks in Monmouth County, many of which have campgrounds, and bays, ponds, creeks, reservoirs, and lakes for fishing. There are 148 miles (238 kilometers) of trails for walkers, runners, cyclists, and equestrians (Monmouth County Park System 2022), and there are eight wildlife management areas in the county, the largest of which is Assunpink (6,393 acres [2,587 hectares]) (NJDEP 2021). The county is home to 21 museums and many local breweries, distilleries, wineries, and golf courses. Popular tourist attractions include the annual Belmar Seafood Festival, jazz festivals, county fairs, and beach movie viewings (Monmouth County Park System 2022). It is home to 12 boardwalks, such as the Asbury Park Boardwalk, which is lined with music venues, food establishments, and shops (Monmouth County Park

System 2022). The 1,655-acre (670-hectare) Sandy Hook Peninsula, which is a unit of the Gateway National Recreation Area, is a very popular tourist destination and is frequented by two million tourists every year (National Park Service 2022). It is home to two landmarks, Fort Hancock and the Sandy Hook Lighthouse, and is popular among bird watchers, as it is used by over 300 species of birds (NJDEP 2022).

The county has 17 public beaches that are heavily frequented by tourists during the summer months for swimming, boating, fishing, and scuba diving. The county has three public beachfront areas: Seven Presidents Oceanfront Park in Long Branch, Bayshore Waterfront Park in Port Monmouth, and Fisherman's Cove Conservation Area in Manasquan, and it is home to 34 marinas, including the Monmouth Cove Marina (CountyOffice.org 2023b).

There were 1,870 accommodation and food service establishments in the county in 2019. Together, these generated over $576 million in annual payroll. There were 488 arts, entertainment, and recreation establishments in Monmouth County, which brought in approximately $197 million in annual payroll (U.S. Census Bureau 2021a, 2021b).

B.6.7 Ocean County, New Jersey

Ocean County is in the center of the Jersey Shore region, with approximately 629 square miles (1,792 square kilometers) of land. The county provides an array of recreational beaches, boardwalks, marinas, and wildlife areas. Popular activities include fishing, hiking, biking, kayaking, golfing, and sightseeing (Ocean County 2022). Ocean County has 27 parks and conservation areas, with over 4,000 acres (1,619 hectares) of preserved land. Sixteen wildlife management areas fall within Ocean County, including Greenwood Forest (32,353 acres [13,093 hectares]), which is partly in Burlington County (NJDEP 2021). Popular coastal attractions include lighthouses, the Tuckerton Seaport, Jenkinson's Boardwalk, and annual seafood and music festivals (Ocean County 2022).

The Edwin B. Forsythe National Wildlife Refuge consists of more than 47,000 acres (19,020 hectares) of coastal habitats and provides wildlife viewing and nature trails. The Barnegat Lighthouse State Park is located on the northern tip of Long Beach Island and provides panoramic views of Barnegat Inlet as well as trails through maritime forests, birding sites for waterfowl, fishing sites, and nature walks.

There were 1,292 accommodation and food service establishments in the county in 2019. Together, these generated over $342 million in annual payroll. There were 272 arts, entertainment, and recreation establishments in Ocean County, which bring in approximately $116 million in annual payroll. Approximately 6.4 percent of all housing units in Ocean County are for seasonal, occupational, or occasional use (U.S. Census Bureau 2021a; 2021b).

B.6.8 Atlantic County, New Jersey

Atlantic County lies in the southern peninsula of New Jersey and encompasses approximately 556 square miles (1,440 square kilometers) of land. Most of the Tuckahoe-Corbin City Fish and Wildlife Management Area is within Atlantic County and consists of approximately 17,500 acres (7,082 hectares) of tidal marsh, woodlands, fields, and impoundments (NJDEP 2018). Ten wildlife management areas totaling 55,360 acres (22,403 hectares) also fall within or partially within Atlantic County: Absecon (3,946 acres [1,597 hectares]), Cedar Lake (360 acres [146 hectares]), Great Egg Harbor River (7,552 acres [3,056 hectares]), Hammonton Creek (5,720 acres [2,315 hectares]), Makepeace Lake (11,737 acres [4,750 hectares]), Malibu Beach (257 acres [104 hectares]), Maple Lake (4,789 acres [1,938 hectares]), Pork Island (868 acres [351 hectares]), Port Republic (1,471 acres [595 hectares]), and Tuckahoe (18,660 acres [7,551 hectares]) (NJDEP 2021).

The county is known for its boardwalk along the beach of Atlantic City, with its nine casinos with restaurants, nightclubs, and game rooms (Stockton University 2021). The county has nine beaches, which collectively total 14 miles (23 kilometers), and 5.75 miles (9.25 kilometers) of boardwalk (Atlantic City 2021). There are several boat launches and marinas in the county, which have small recreational boat rentals. Recreational fishing is permitted on the beaches, outside of guarded areas, and from the jetties. There are also multiple fishing piers available to the public.

There were 827 accommodation and food service establishments in the county in 2019. Together, these generated over $1.2 billion in annual payroll. There were 113 arts, entertainment, and recreation establishments in Atlantic County, which bring in approximately $41 million in annual payroll. Approximately 13.4 percent of all housing units in Atlantic County are for seasonal, occupational, or occasional use (U.S. Census Bureau 2021a, 2021b).

B.6.9 Cape May County, New Jersey

Cape May is New Jersey's southernmost county and encompasses 251.5 square miles of land. There are many parks, state forests, and wildlife management areas in Cape May County. The Cape May National Wildlife Refuge encompasses 11,500 acres (4,654 hectares) of grasslands, saltmarshes, and beachfront (Friends of Cape May National Wildlife Refuge n.d.). The Cape May Coastal Wetlands Wildlife Management Area extends along the coast of Cape May County and occupies approximately 17,842 acres (7,220 hectares) (NJDEP 2021).

Cape May County is considered one of the premier beach destinations along the Mid-Atlantic coast. The Ocean City Boardwalk is more than 2 miles (3 kilometers) long and is lined with shops and amusement park rides. The Wildwood Boardwalk runs from Wildwood into North Wildwood and is home to many amusement attractions (Cape May County 2022). Recreational fishing occurs along the back bays and from the surf, piers, and boats along the Jersey Cape (Cape May County 2022).

There were 917 accommodation and food service establishments in the county in 2019. Together, these generated over $240 million in annual payroll. There were 143 arts, entertainment, and recreation establishments in Cape May County, which brought in approximately $50 million in annual payroll. Approximately 50.9 percent of all housing units in Cape May County are for seasonal, occupational, or occasional use (U.S. Census Bureau 2021a, 2021b).

B.7 Offshore Wind Vessel Types

Over 25 different types of vessels are expected to be used to construct, operate, and maintain an offshore wind project. The vessels shown in Table B.7-1 are expected to be representative of the vessels used for the NY Bight projects (ACP 2021). Multiple vessels will be needed for each offshore wind project, but the exact number and types will be dependent on project size, distance from shore, environmental conditions, and other factors. The majority of these vessels will be coastwise qualified (i.e., United States-flagged vessels with American crews that are built in the United States).

Different types of vessels are projected to be needed during the different offshore wind project stages, including Surveying, Cable Lay, Component Transfer, Turbine Installation, Development, Construction, Decommissioning, and Operations and Maintenance (O&M). As outlined in Table B.7-1, Service Operation Vessels (SOVs) and Crew Transfer Vessels (CTVs) will be the primary vessel used by the offshore wind industry. These vessels would be coastwise qualified vessels and used across the lifetime of each project in both the construction and O&M phases. Additionally, there are a large variety of vessels that could be used during the 2–3-year construction and surveying stages, many of which will be coastwise qualified. The number of coastwise qualified vessels used during construction are anticipated to grow as factories and supply chains are built in the United States. The number of vessels estimated for each class of vessel in Table B.7-1 is for a typical 800-megawatt offshore wind project. However, the number and type of vessels used will vary greatly between projects, depending on the selected installation techniques, distance from shore, the rate of construction of the domestic supply chain, and other factors.

Table B.7-1. Vessels used throughout the 35-year lifetime of a typical offshore wind project, including both construction and O&M

Vessel Type	Approximate Number of Vessels	Vessel Activities Conducted
Project Lifetime		
Crew Transfer Vessel (CTV)	Construction: 1–4 Vessels O&M: 0–3 Vessels	CTVs transfer personnel and light equipment in support of construction and O&M. During construction, both the developer and turbine manufacturer are likely to hire two CTVs, respectively. For nearshore projects (less than ~1.5 hours from port) CTVs will be primary for O&M; further offshore projects will use SOVs.
Service Operation Vessel (SOV)/Walk to Work/ Commissioning Support Vessel	Construction: 0–2 Vessels O&M: 0–3 Vessels	These vessels are equipped with motion compensated gangway allowing turbine technicians to “walk to work” directly from the vessel to the turbine. Use of SOVs or CTVs depends mostly on distance of the project from shore. Most, but not all, projects will utilize SOVs. During construction, SOVs assist with wind turbine installation and commissioning (bringing turbine and cables online). Developers and turbine manufacturers are likely to hire one SOV each. During O&M, SOVs would be used for turbine servicing and operation.

Vessel Type	Approximate Number of Vessels	Vessel Activities Conducted
Surveying		
Environmental Survey	2–4 Vessels	Environmental survey vessels conduct fisheries and benthic surveys on export cable routes and in the lease area. They are also used to place LIDAR buoys for various environmental assessments. A variety of vessels do this work: nearshore work tends to be smaller vessels, and offshore work uses larger vessels.
Geotechnical Survey	1–6 Vessels	Geotechnical survey vessels conduct physical sampling and testing of seabed characteristics to optimally place turbines and cables, typically by conducting borings or sampling to specific depths below the mean seabed.
Geophysical Survey	1–6 Vessels	Geophysical survey vessels acoustically map seabed features, surface, and sub surface within a lease area and potential Export Cable Routes. Detects and charts unexploded ordinances (UXO).
Cable Laying		
Export Cable Laying Vessel	1–2 Vessels	Export Cable Laying Vessels are large, specialist cable installation vessel equipped with 1–2 high-capacity carousels capable of reeling long lengths of large diameter export cables, exporting from cable manufacturing facility and installation on wind farm sites. Typically, a dynamic positioning vessel is used for installation in water depths greater than 32.8 feet (10 meters). These vessels will also physically sample and test seabed characteristics to optimally place cables, typically by conducting borings or sampling to specific depths below the mean seabed. These vessels also have the potential to include cable burial spread.
Shallow Water Export Cable Lay Vessel	1–2 Vessels	These vessels are flat-bottomed vessels/barges equipped with medium to large carousel(s) and anchor handling spreads for cable installation in water depths ranging from 0 feet/meters (beached) to approximately 32.8 feet (10 meters). The vessels would handle cable installation from cable landing/Horizontal Directional Drilling (HDD) sites to water depths for typical dynamic positioning vessel. These vessels also have the potential to include cable burial spread.
Nearshore Export Cable Landing Support Barge	1–2 Vessels	These are vessels used for landfall and nearshore support works, support for HDD and landfall pull-in operation of export cable.
Export and Array Cable Support Vessels	2–6 Vessels	A variety of ancillary cable installation support vessels will be used during construction: cable jointing/splicing cables, multiact shallow water anchor handling, spud leg pontoon, lift-boat/jack up for shallow water operations, Pre-lay Grapnel Run vessel, and fisheries support vessels. During O&M, these vessels will be used for cable subsea inspection and repairs.
Cable Crossing Construction Vessel	1–2 Vessels	Cable Crossing Construction vessels are used for installation of cable protection structures (mattresses, rock bags, grout bags) in a range of water depths from nearshore (shallow) to offshore wind farm site (deepwater).

Vessel Type	Approximate Number of Vessels	Vessel Activities Conducted
Array Cable Laying Vessel	1–3 Vessels	These vessels are used for cable installation between turbines and from turbines to offshore substations. Typically installed with crew transfer facilities and cable pull in equipment for cable installation into each turbine. These vessels also have the potential to include cable burial spread.
Anchor Handling Vessels	2–6 Vessels	These vessels are used to support multi-anchor cable installation. Cable installation barges can have 8–12 anchors in shallow water.
Cable Trenching Vessel	1–2 Vessels	These vessels create trenches in the seafloor to lay cable. These can be nearshore (shallow water) or offshore (deepwater) vessels equipped with cable pre- or post-lay burial tool, typically A-Frame launched seabed trencher – remotely operated vehicle Jetter/Cutter, Cable plow, Jetting sled. These vessels have the potential to require bollard pull (cable plow).
Development, Construction, & Decommissioning		
Floating Heavy Lift Foundation Vessel	1–2 Vessels	These vessels are utilized in substation, transition piece, and foundation installation, including pile-driving. Most are floating, but sometimes a jack up vessel is used.
Wind Turbine Installation Vessel	1–2 Vessels	During construction, these vessels are utilized in turbine installation. During O&M, these vessels are utilized for main component exchange, such as replacing nacelles, generators, gear boxes. If not coastwise qualified, they would be paired with a feedering spread.
Feedering Spread: Barges and Ocean-Going Tugs	2–3 Vessels	Feedering spreads are a newer installation concept in the offshore wind industry. Feeder barges supply components to installation vessels from port in compliance with the Jones Act. These vessels are likely to vary depending on the experience of the initial offshore wind projects in the United States. Feedering spreads include coastwise concepts such as: towed barges, self-propelled vessels, or ultra large lift boats. The number of vessels will depend on the feedering concept and the number of wind turbine installation vessels. A towed barge spread would likely include large deck barges with motion compensation systems, offshore tugs for station keeping, transit tugs towing barges from port to offshore locations, and port tugs for marshalling/port movements. Zero feedering spreads are required with a coastwise qualified wind turbine installation vessel. These vessels are only for installation, and not transportation between ports.
Supply Chain Transportation	2–3 Vessels	All vessels will need to be coastwise qualified vessels in order to move components between the United States manufacturing sites and marshalling areas.
Rock Dumping/Scour Protection Vessel	1–2 Vessels	These vessels are used to install protective rock for seabed infrastructure (such as cables and foundations), and are utilized in multiple phases (e.g., site preparation, scour rock around monopile, application of rock scour on top of cables, etc.).

Vessel Type	Approximate Number of Vessels	Vessel Activities Conducted
Dredging Vessels	2–4 Vessels	Dredging vessels are used to level or lower the seafloor in preparation for construction of cables and turbines. Dredging vessels include Trailing Suction Hoppers, Cutter Suction Hoppers, and Grab Hoppers.
Safety/Scout Vessel	1–4 Vessels	Safety/Scout vessels are used during Surveying and Construction, and ensure operational safety with ongoing marine traffic, look out for fixed fishing gear, and interface with fishing vessels.
Noise Mitigation Vessel	1 Vessel	These vessels are used to create a bubble curtain to mitigate noise from pile-driving.
Accommodation Vessel	0–2 Vessels	Accommodation vessels house the turbine technicians, and other crew during favorable weather windows, such as the summer months.
Construction Support Vessel	5–25 Vessels	These vessels carry fuel, supplies, and other support equipment to construction vessels.

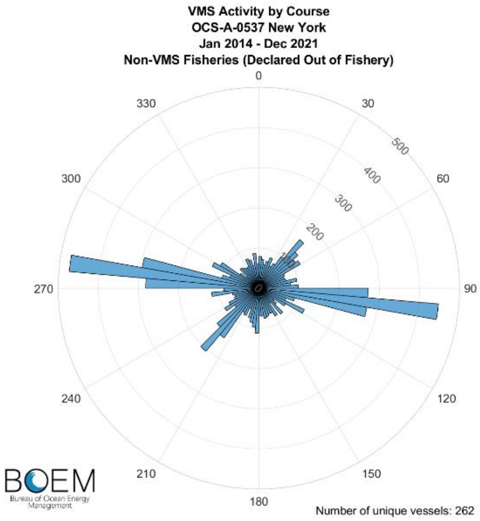
Source: ACP 2021.

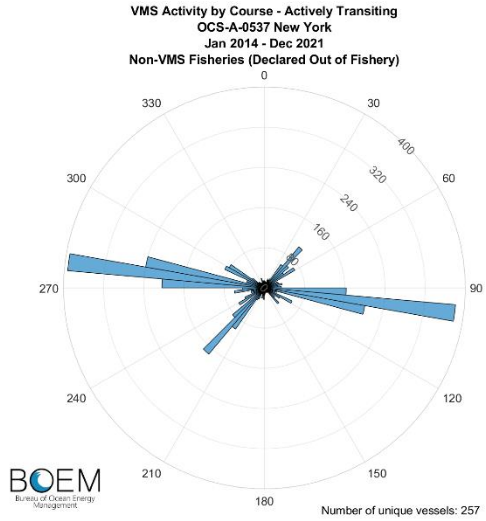
B.8 Commercial Fisheries and For-Hire Recreational Fishing

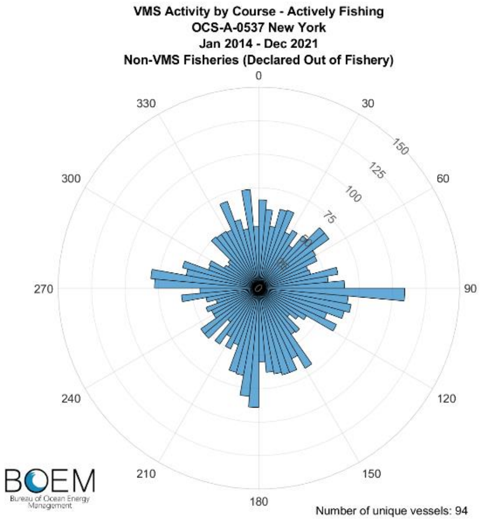
B.8.1 Vessel Monitoring System Data

Using Vessel Monitoring System (VMS) data conveyed in individual position reports (pings) from January 2014 to December 2021, the Bureau of Ocean Energy Management (BOEM) compiled information about fishing activities in the NY Bight lease areas (NMFS 2021). Figure 3.6.1-2 through Figure 3.6.1-19 in Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, cover all fishing activities (transiting and active fishing) for VMS fisheries. Data on non-VMS fisheries are presented here. Figure B.8-1 to Figure B.8-6 provide the histograms for non-VMS fisheries.[4] The larger bars in the polar histograms represent a greater number of position reports showing fishing vessels moving in a certain direction in the NY Bight lease areas. The polar histograms differ with respect to their scales. Non-VMS vessels operated in an east–west direction in OCS-A 0537, while vessels in OCS-A 0538 operated in a northwest–southeast direction. Non-VMS vessels in the remaining lease areas generally operated in a northeast–southwest direction.

[4] VMS coverage is not universal for all fisheries. Non-VMS data have been declared as out of fishery, meaning they have been declared out of a fishery managed by days-at-sea effort controls (i.e., scallops, northeast multispecies, and monkfish).

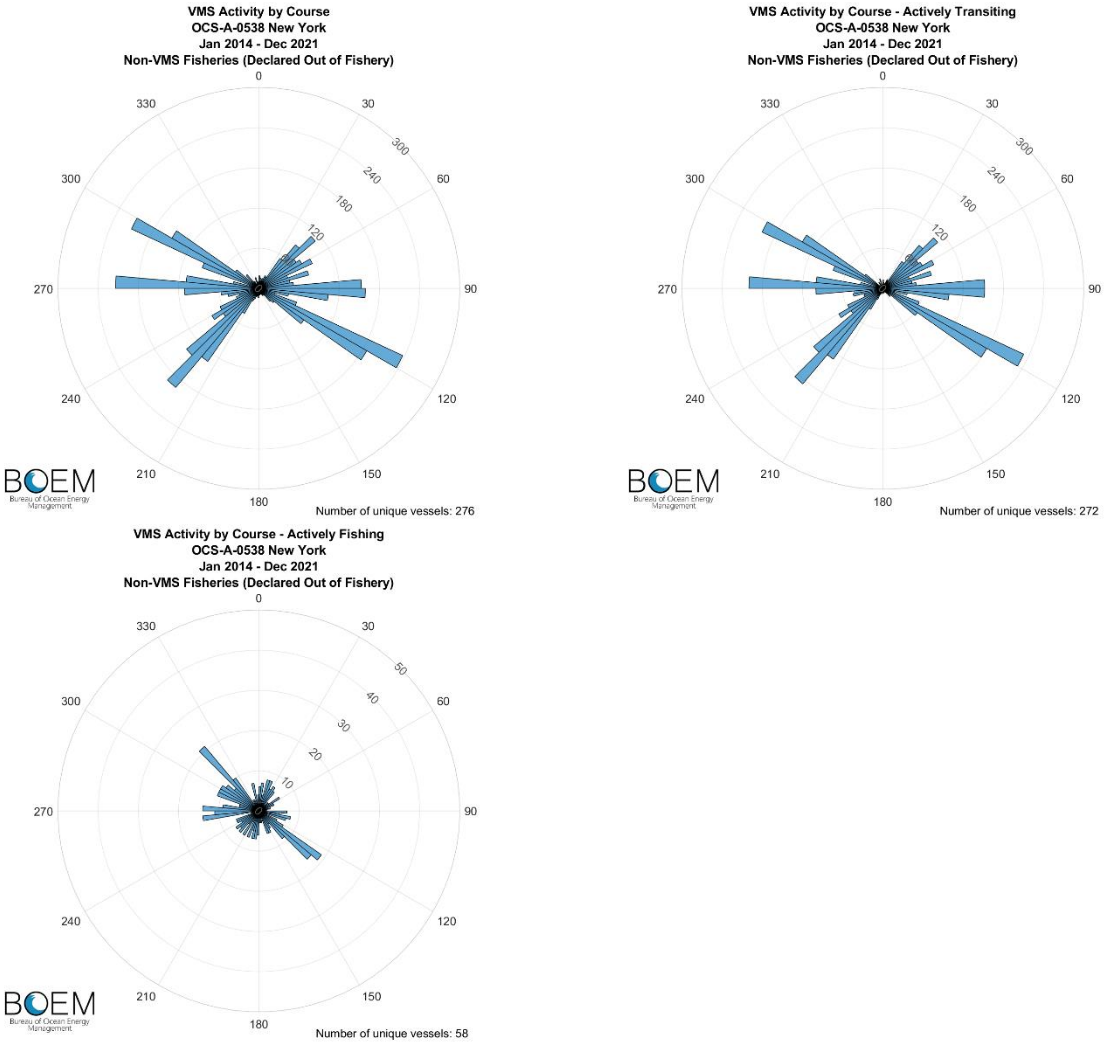






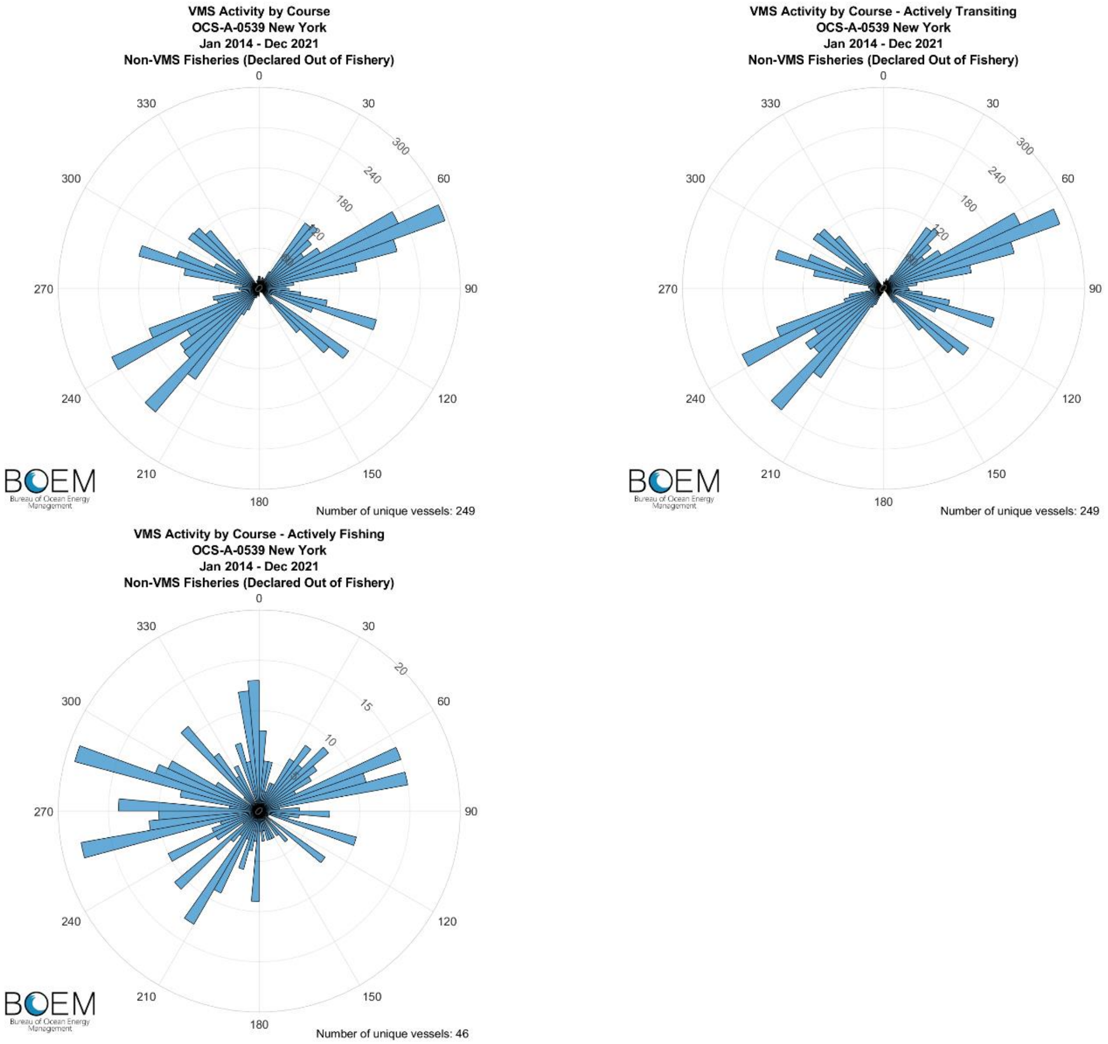
Source: Developed by BOEM using VMS data provided by National Marine Fisheries Service (NMFS) (2021).

Figure B.8-1. VMS bearings of non-VMS fishery vessels at all speeds, transiting, and fishing within Lease Area OCS-A 0537 by FMP fishery, January 2014–December 2021



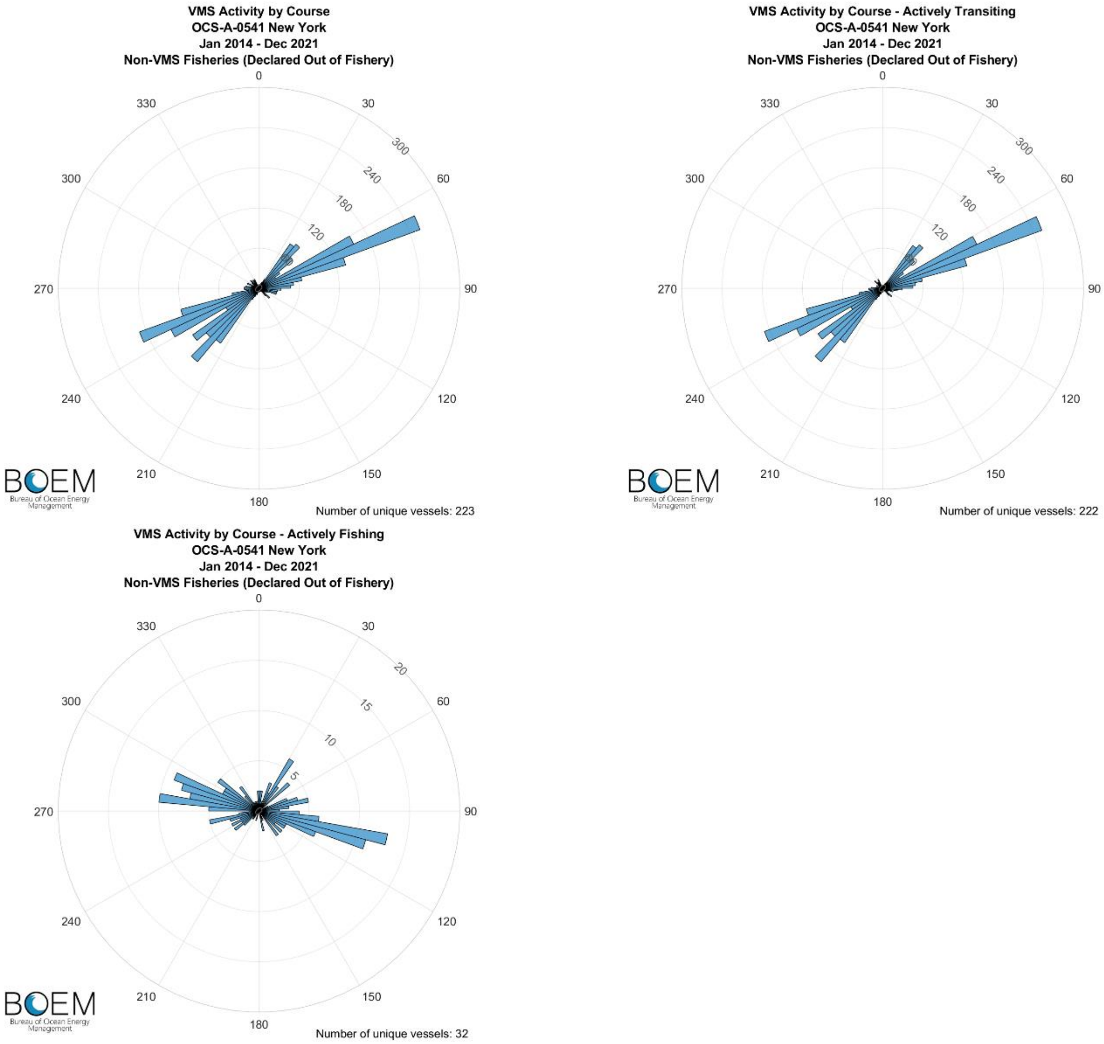
Source: Developed by BOEM using VMS data provided by NMFS (2021).

Figure B.8-2. VMS bearings of non-VMS fishery vessels at all speeds, transiting, and fishing within Lease Area OCS-A 0538 by FMP fishery, January 2014–December 2021



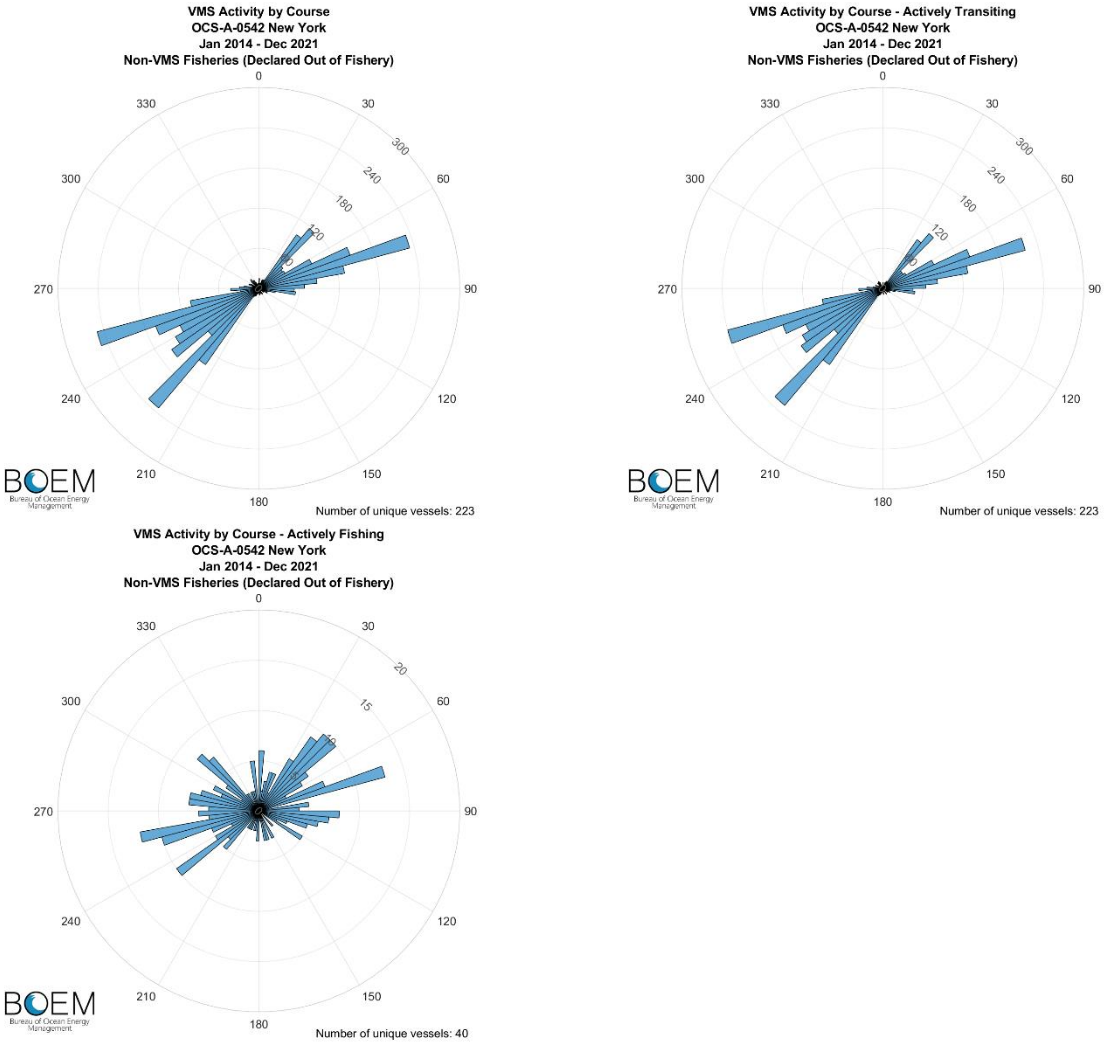
Source: Developed by BOEM using VMS data provided by NMFS (2021).

Figure B.8-3. VMS bearings of non-VMS fishery vessels at all speeds, transiting, and fishing within Lease Area OCS-A 0539 by FMP fishery, January 2014–December 2021



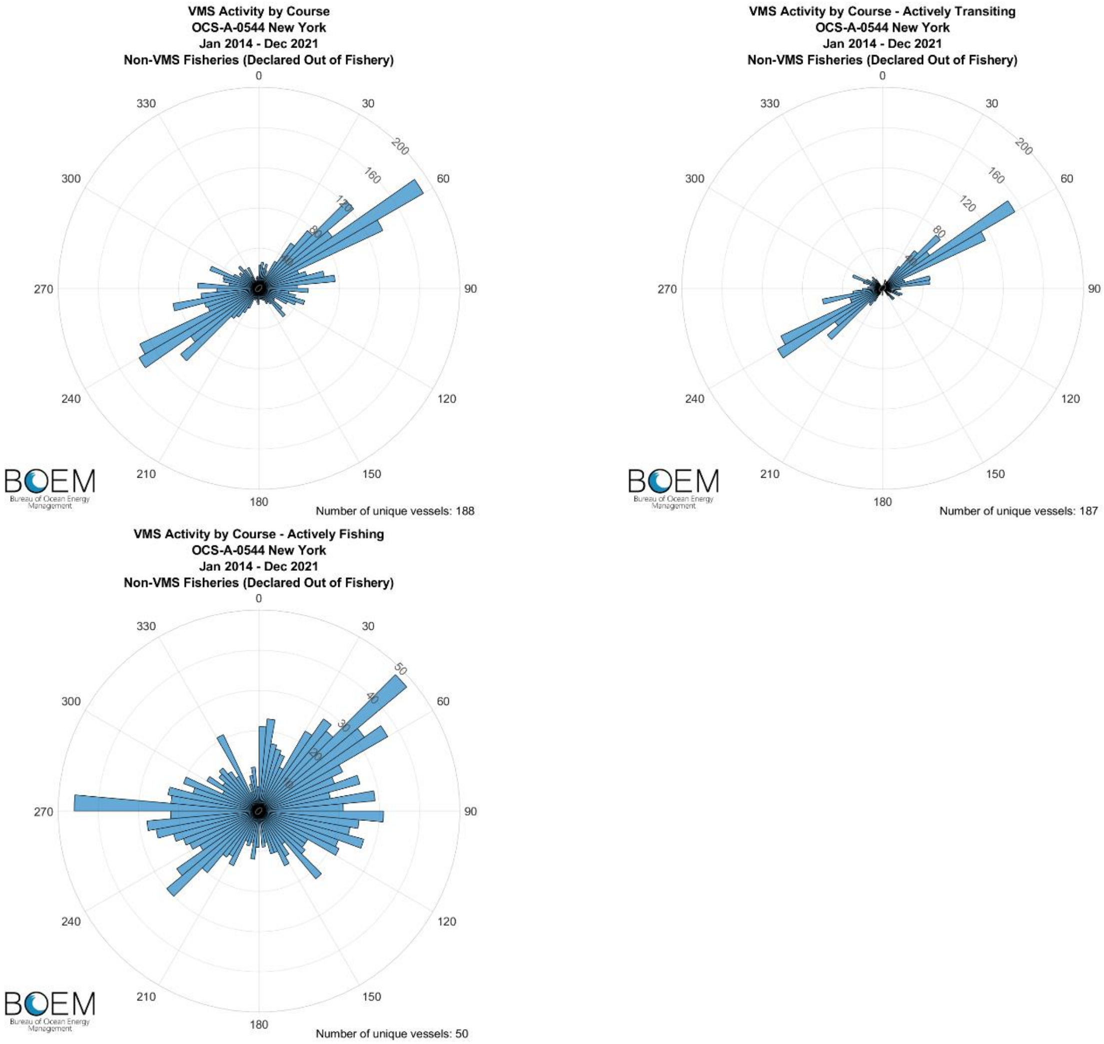
Source: Developed by BOEM using VMS data provided by NMFS (2021).

Figure B.8-4. VMS bearings of non-VMS fishery vessels at all speeds, transiting, and fishing within Lease Area OCS-A 0541 by FMP fishery, January 2014–December 2021



Source: Developed by BOEM using VMS data provided by NMFS (2021).

Figure B.8-5. VMS bearings of non-VMS fishery vessels at all speeds, transiting, and fishing within Lease Area OCS-A 0542 by FMP fishery, January 2014–December 2021



Source: Developed by BOEM using VMS data provided by NMFS (2021).

Figure B.8-6. VMS bearings of non-VMS fishery vessels at all speeds, transiting, and fishing within Lease Area OCS-A 0544 by FMP fishery, January 2014–December 2021

B.8.2 Percentage of Revenue by Permit

To characterize differences in the economic importance of fishing grounds in the Wind Energy Areas (WEAs) across the commercial fishing fleet, NMFS analyzed the percentage of each permit's total commercial fishing revenue attributed to catch. The distributions of the vessel-level annual revenue percentages from 2008 to 2022 for the New York Bight lease areas are provided in the boxplots in Figure B.8-7 through Figure B.8-12. The boxplot begins at the first quartile, or the value beneath which 25 percent of all vessel-level revenue percentages fall. A thick line within the box identifies the median, the observation that 50 percent of vessel-level revenue percentages are above or beneath. The box ends at the third quartile, or the vessel-level revenue percentage beneath which 75 percent of observations fall. The "whiskers" (dashed line terminating in a vertical line) that jut out from each side of the box represent the minimum and maximum non-outlier range. In the context of this analysis, an outlier is a vessel that derived an exceptionally high proportion of its annual revenue from the WEA in comparison to other vessels that fished in the area. Although outliers derived a high proportion of their annual revenue from the WEAs in comparison to other vessels that fished in the area, in any given year, the revenue percentage for the majority of outliers was below 5 percent. Therefore, while some vessels depended heavily on the WEAs their commercial fishing revenue, most derived a small percentage of their total annual revenue from the area.

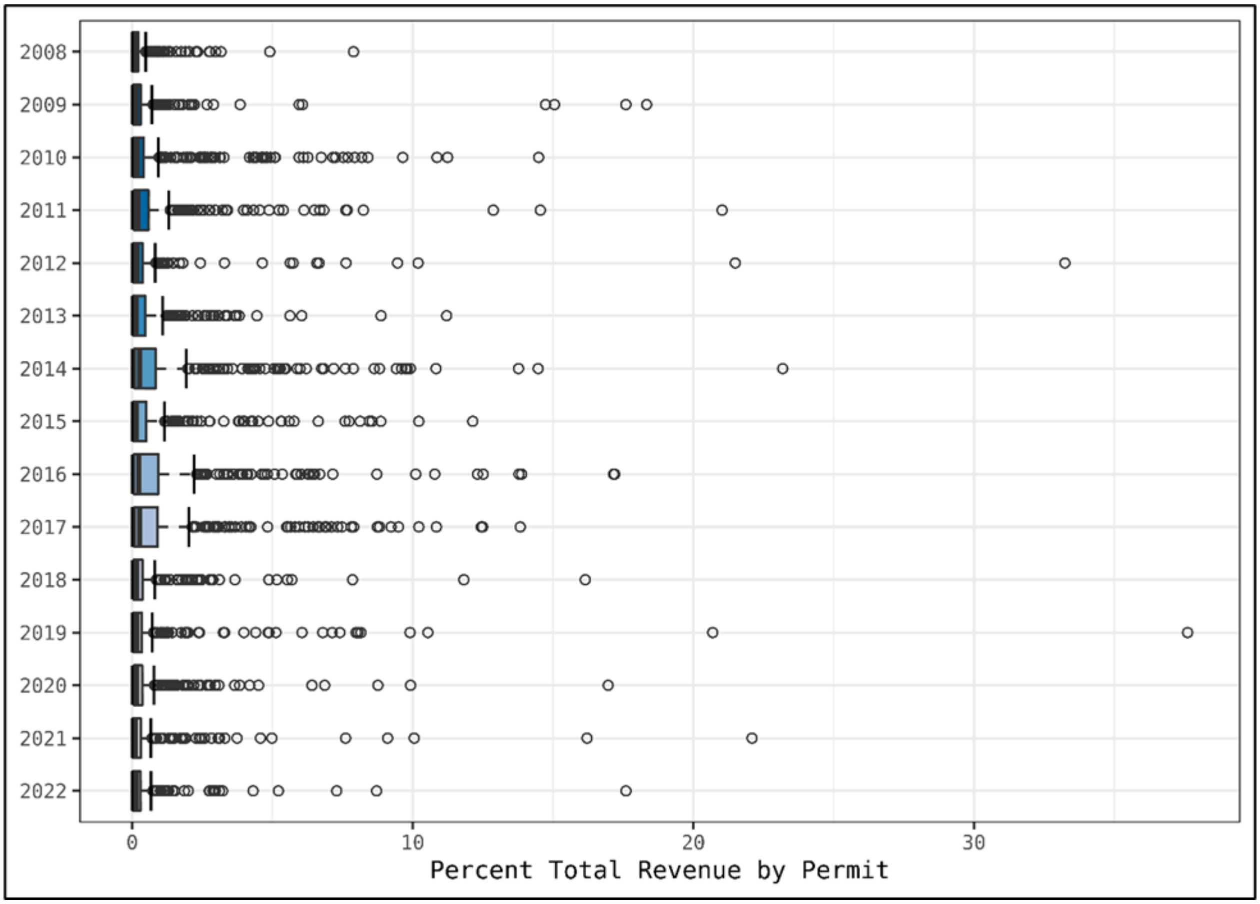


Figure B.8-7. Percentage of revenue harvested from the OCS-A 0537 lease area from 2008 to 2022.

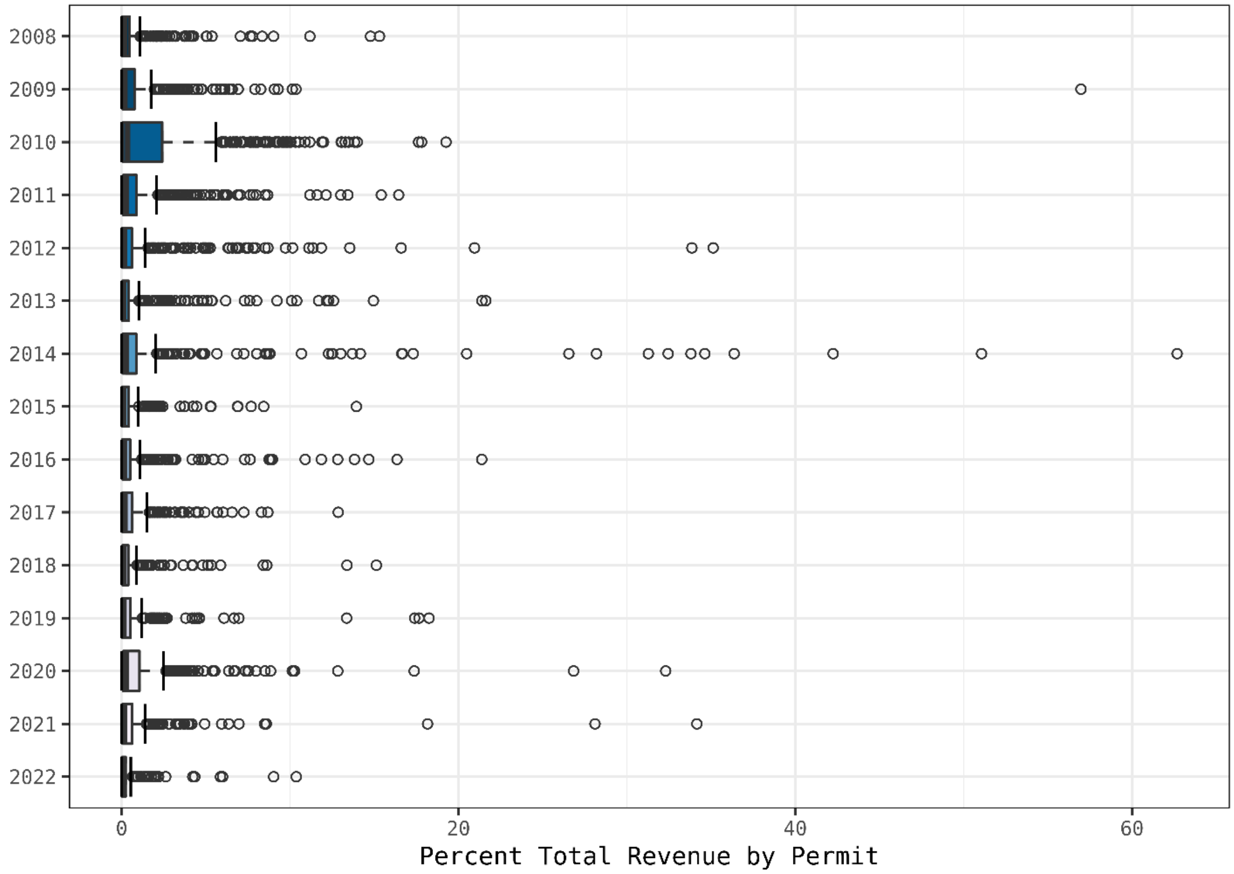


Figure B.8-8. Percentage of revenue harvested from the OCS-A 0538 lease area from 2008 to 2022.

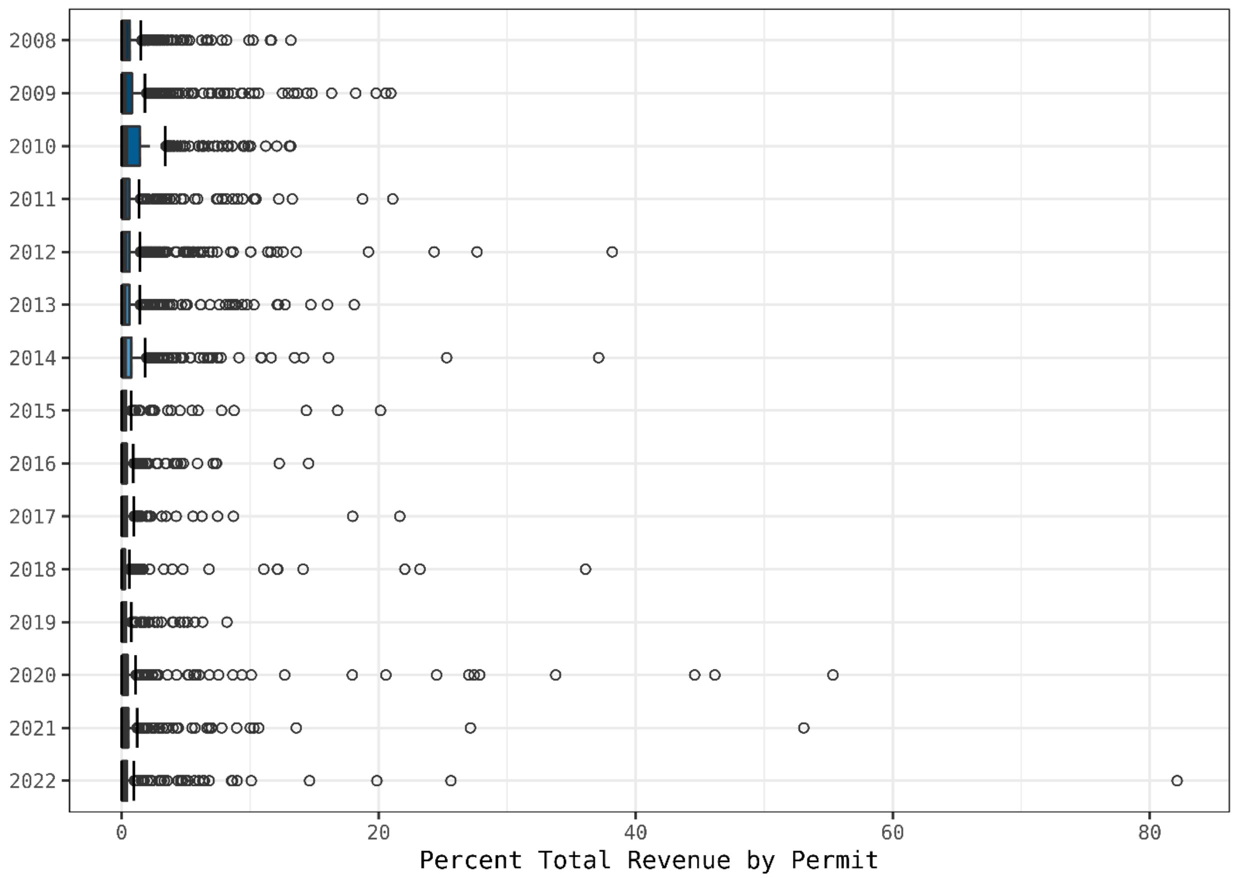


Figure B.8-9. Percentage of revenue harvested from the OCS-A 0539 lease area from 2008 to 2022.

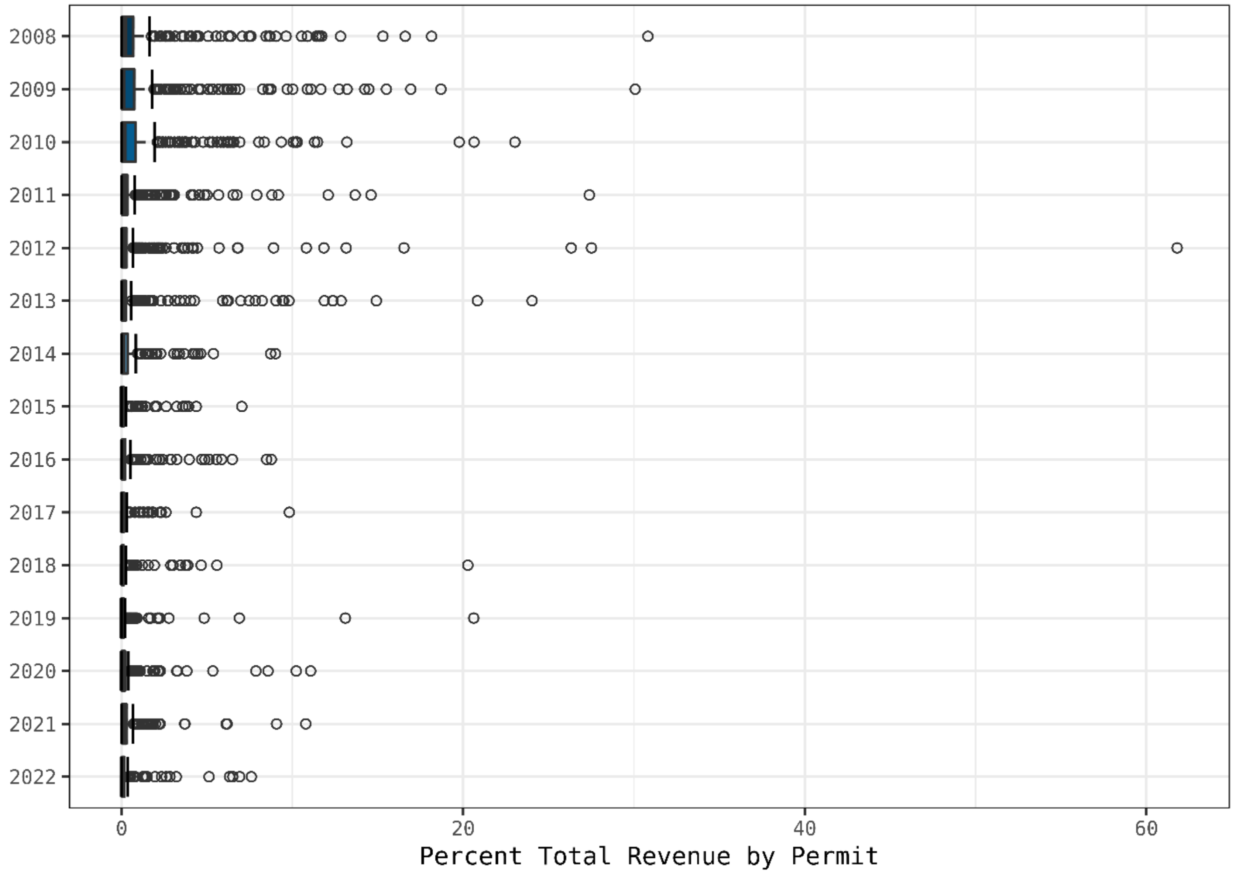


Figure B.8-10. Percentage of revenue harvested from the OCS-A 0541 lease area from 2008 to 2022.

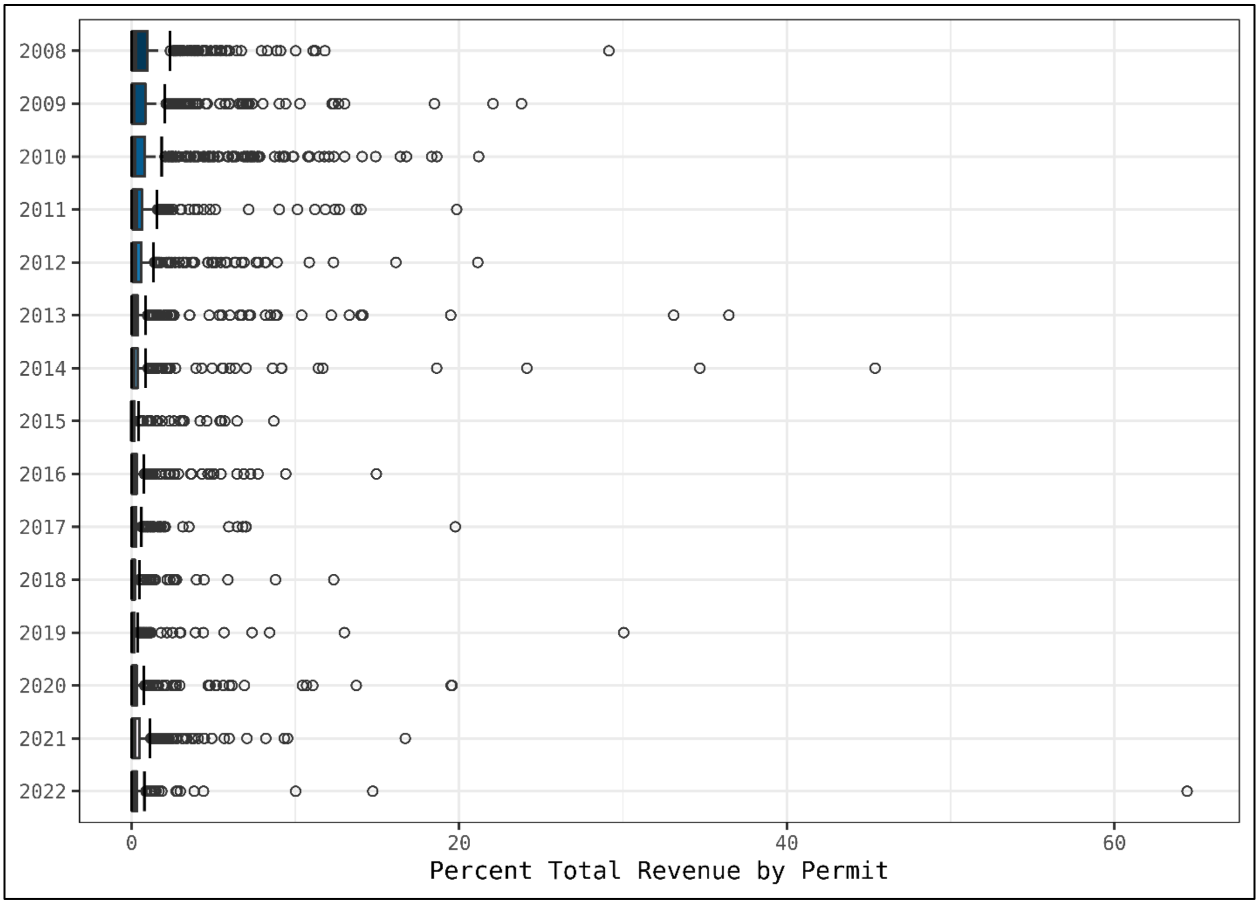


Figure B.8-11. Percentage of revenue harvested from the OCS-A 0542 lease area from 2008 to 2022.

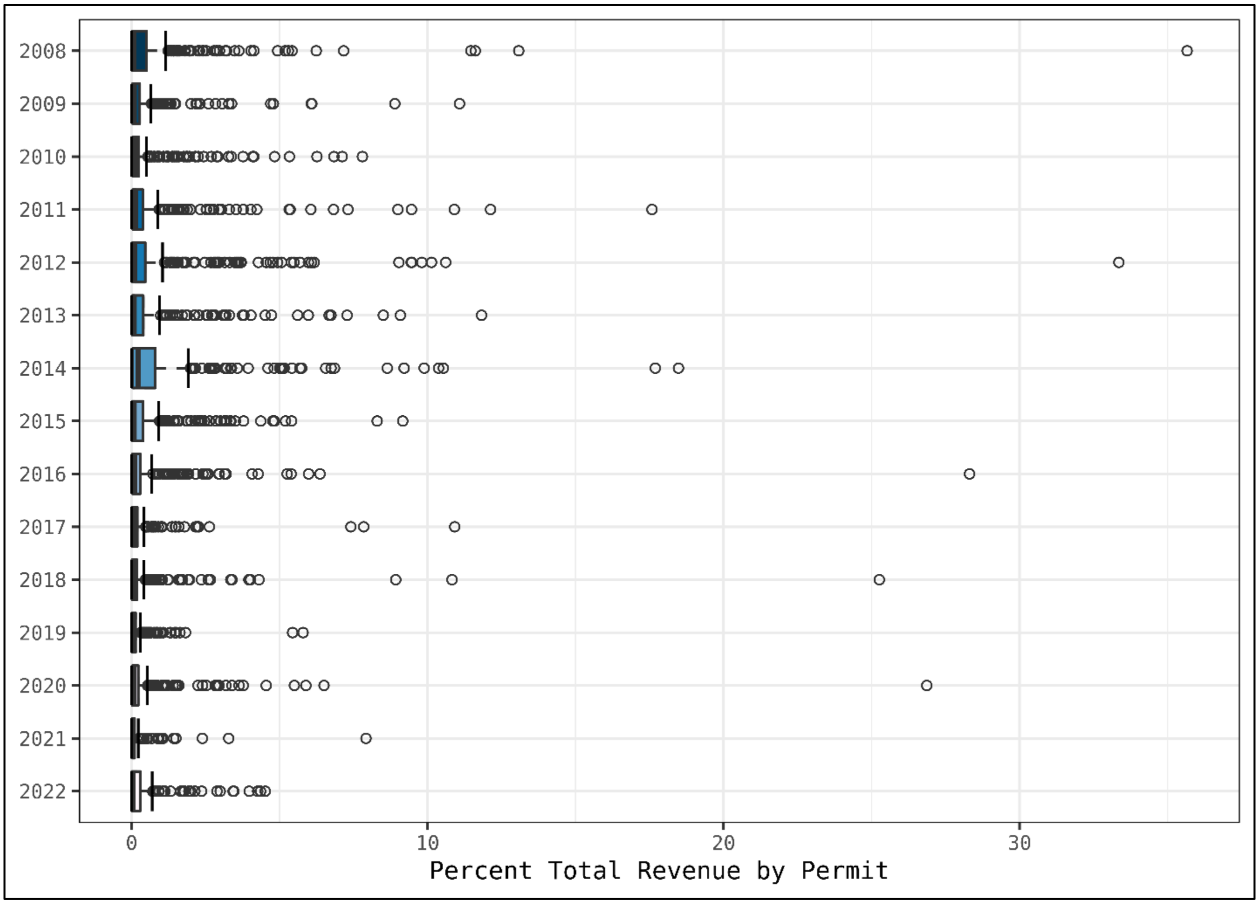


Figure B.8-12. Percentage of revenue harvested from the OCS-A 0544 lease area from 2008 to 2022

B.9 Use of New and Emerging Technologies – Recommended Practice MUL-21

BOEM is evaluating the potential for new and emerging technologies to reduce environmental impacts from the NY Bight projects under the Recommended Practice MUL-21 (see Appendix G, *Mitigation and Monitoring*, for full text of the measure). As part of this measure, BOEM encourages lessees to explore new technologies that may avoid or reduce impacts during construction, O&M, and decommissioning compared to more conventional methods. This section describes five examples of new and emerging technologies that could be evaluated for deployment for the NY Bight projects. This list of new and emerging technologies is not exhaustive, and lessees may identify other technologies that could be implemented to avoid or reduce impacts as part of MUL-21. The technological readiness of each of the following technologies varies and commercial application may not be feasible for the NY Bight leases depending on the timing of the proposed development schedule for each lease area. The description of the technologies is largely based on research conducted by the National Renewable Energy Laboratory (NREL) (NREL 2023). As these technologies are new and largely untested in the offshore wind industry, not all have been subject to detailed study, and additional information about the specific design and deployment of these technologies would be needed to fully assess impacts.

Closed-loop cooling: Some offshore wind projects may use high-voltage direct current (HVDC) offshore converter stations that would convert alternating current to direct current before transmission to onshore project components. These HVDC systems are typically cooled by an open-loop system that intakes cool sea water and discharges warmer water back into the ocean, resulting in the potential for impingement and entrainment of organisms and thermal plumes (for a detailed description of these impacts, refer to Section 3.4.2, *Water Quality*, Section 3.5.2, *Benthic Resources*, Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, Section 3.5.6, *Marine Mammals*, and Section 3.5.7, *Sea Turtles*). A subsea cooler is an example of a closed-loop cooling technology that has been successfully used for commercial subsea gas production. Subsea cooler technology does not yet have demonstrated commercial application for offshore wind, but it is an emerging technology that could become viable on the timeline of the NY Bight projects (NREL 2023). As opposed to a topside cooling system that intakes seawater on an offshore HVDC converter station as analyzed under Alternative B, a subsea cooler would be located on the seabed by the HVDC converter platform and would reject heat directly to the surrounding ocean, relying on ambient ocean flows and passive thermal convection to circulate seawater past the submerged cooling tubes. Because the system does not intake or discharge seawater, there would be no impingement/entrainment impacts and no discharge of sodium hypochlorite anti-fouling solution. While there would be no discharge of warmer water, passive cooling would be expected to result in some warming of the surrounding ocean.

This technology could minimize impacts associated with discharges/intakes impact-producing factor (IPF) for the following resources: water quality; benthic resources; finfish, invertebrates, and essential fish habitat (EFH); marine mammals; and sea turtles.

Quieter monopile installation: Alternate quieter pile-driving methods include seawater hammers, vibro-driving with electromechanical vibrating units clamped to a suspended monopile, and a method that combines vibro-driving with water jets. The seawater hammer method raises a large column of seawater above the pile head and then releases it to fall on the pile resulting in a longer pulse duration reducing the pulse intensity. Vibro-driving units use rotating eccentric weights operating at low frequencies (<20–40 Hertz) to induce flexural oscillations of the monopile, whose weight is suspended by crane from a surface vessel. The vibro-driving with water jets uses both vibration and water to fluidize the soil inside the monopile. These quieter monopile installation methods can yield a 20 decibel (dB) or greater reduction in source noise levels relative to unmitigated conventional impact hammering resulting in a reduction in the radius of induced marine life behavioral response (NREL 2023). For a detailed description of impacts related to conventional impact hammering, refer to Section 3.5.2, *Benthic Resources;* Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat;* Section 3.5.6, *Marine Mammals;* and Section 3.5.7, *Sea Turtles*.

This technology could reduce noise source levels, thereby reducing potential noise impacts on marine mammals, sea turtles, finfish, and invertebrates, producing fewer behavioral changes in these species and reducing the risk of injury. However, the seawater hammer and the combined vibro-driving with water jets method could also result in additional impacts associated with the discharge/intakes IPF for the following resources: benthic resources; finfish, invertebrates, and EFH; marine mammals; and sea turtles as each method requires intake of seawater for operation resulting in impingement and entrainment of organisms. The impacts relative to the discharge/intake IPF will have to be evaluated on a project-by-project basis since the water system flow requirements are governed by the pile dimensions and the seabed soil.

Cable-in-pipe array cable installation: The Representative Project Design Envelope (RPDE) analyzed under Alternative B for the NY Bight projects considers the following interarray cable installation methods: mechanical or jet plowing options including trencher, precision installation (using a remotely operated vehicle/diver), mechanical cutter, controlled flow excavator, jet plowing, and vertical injection. A new and emerging technology allows for the remote installation of unarmored cables from offshore electric service platforms by pressurized water flow in thermoplastic conduit pipe that has been pre-laid and buried in the seabed. This method allows for seamless transitions from the conduit pipe turbine to turbine along an array cable string. The array cable-in-pipe system uses pressurized water injected into pre-laid thermoplastic pipe, and the water flow pushes one or more pigs attached to the front end of the cable (and along the cable, as needed) enabling the cable to be carried through the pipe by the pressurized water flow (NREL 2023).

Cable-in-pipe installation enables the use of standard onshore cables on standard drums, which have a wider range of cable suppliers, and which could reduce cable supply costs compared with armored submarine cable. Moreover, unarmored cable has 10–15 percent less power loss than armored cable, due to induced current in the armor wires. In addition, repair and replacement of damaged cable can be done within the conduit pipe without disturbing the seabed. Implementation of this technology could reduce the impacts associated with periodic repair and maintenance needed for interarray cables associated with the cable emplacement and maintenance IPF for the following resources: benthic resources; finfish, invertebrates, and EFH; marine mammals; and sea turtles.

Self-installing frond mats: The RPDE analyzed under Alternative B for the NY Bight projects considers the following potential scour protection methods for WTG and OSS foundations: rock, mattress protection, sandbags, and stone bags. A new and emerging technology that lessees could install in place of these conventional scour protection methods is self-installing frond mattresses. Self-installing frond mats involve pre-attaching frond mat panels around a monopile or suction bucket. Once the foundation is at the target embedment depth, the panels would be released, much like an unfolding, inverted umbrella (NREL 2023). Test results have shown that self-installing frond mats can provide effective scour protection around both monopiles and suction bucket jackets, capable of limiting the depth of localized scour. Use of self-installing frond mats to replace conventional riprap scour protection would have the environmental benefit of substantially reducing the demand for subsea rock installation vessels, potentially eliminating hundreds of vessel trips and associated impacts, including reduced air emissions, underwater noise levels, accidental releases, and vessel strike. Frond mats can also result in the buildup of naturally contoured sandbank around the fronded area, avoiding potential edge scour that can occur with stone riprap layers. Conversely, using frond mats instead of rock or concrete scour protection could reduce benefits from an increase in hard surfaces for benthic species dependent on hardbottom habitat.

This technology could minimize resource impacts associated with the accidental releases, air emissions, noise, and vessel traffic IPFs for the following resources: air quality; water quality; marine mammals;

finfish, invertebrates, and EFH; and sea turtles. This technology could reduce beneficial impacts associated with the presence of structure IPF for the following resources: benthic resources.

B.10 Transmission Infrastructure Development Efforts – New Jersey

In November 2023, the New Jersey Board of Public Utilities (NJBPU) initiated issuance of a solicitation for construction of the Prebuild Infrastructure (PBI), which is the infrastructure between the identified landing point at Sea Girt National Guard Training Center (NGTC) in New Jersey and the point of interconnection at the Larrabee Collection Station, a distance of approximately 12 miles.[5] The PBI will consist of duct banks and cable vaults to accommodate transmission circuits for multiple future offshore wind projects along with the transition vaults at the NGTC and horizontal directional drilling (HDD) bores under the shoreline interface from the transition vaults to the offshore termination area, thereby enabling these future projects to access the wholesale transmission system. The PBI will include only the necessary infrastructure to house the transmission cables and not the cables themselves. The PBI is envisioned as a single construction effort, thereby minimizing environmental impacts and disruption to local communities. At a later date, when each offshore wind generation project is under construction, each project will be responsible for pulling its own export cables through the existing duct banks and interconnecting at the Larrabee Collection Station.

By design, the PBI is being procured, developed, owned, and operated through mechanisms that are entirely independent of the offshore wind generation projects that will ultimately use the PBI. PBI will be funded through the Federal Energy Regulatory Commission's transmission rates and will be developed, owned, and operated by a transmission system developer. Offshore wind generation projects anticipated to use the PBI include Attentive Energy Two[6] and Leading Light Wind[7].

B.10.1 Description of Onshore/Upland Activities

The onshore portion of the PBI extends from the cable vaults beside the Larrabee Collection Station to the transition vaults to be built and installed at Sea Girt. It will include duct banks and related facilities to accommodate up to four separate offshore wind circuits. Cable vaults will be constructed at intervals along the duct banks to access the duct banks and enable the offshore wind developers to pull cables through the completed PBI facilities. The PBI may consist of a single right-of-way (ROW) that can accommodate all four circuits for multiple separate offshore wind projects. Alternatively, the PBI may consist of two separate ROWs, each with two circuits, depending on the width of the routes selected. Example PBI layouts are illustrated in Figure B.10-1.

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[5] See *In the Matter of the Opening of a Solicitation for a Transmission Infrastructure Project to Support New Jersey's Offshore Wind Public Policy*, BPU Docket No. QO23100719, Order dated November 17, 2023 (initiating a prebuild infrastructure solicitation through the release of a Prebuild Solicitation Guidance Document).

[6] https://www.nj.gov/bpu/pdf/boardorders/2024/20240124/8A%20ORDER%20Solicitation%203%20Attentive.pdf

[7] https://www.nj.gov/bpu/pdf/boardorders/2024/20240124/8A%20ORDER%20Solicitation%203%20Invenergy.pdf

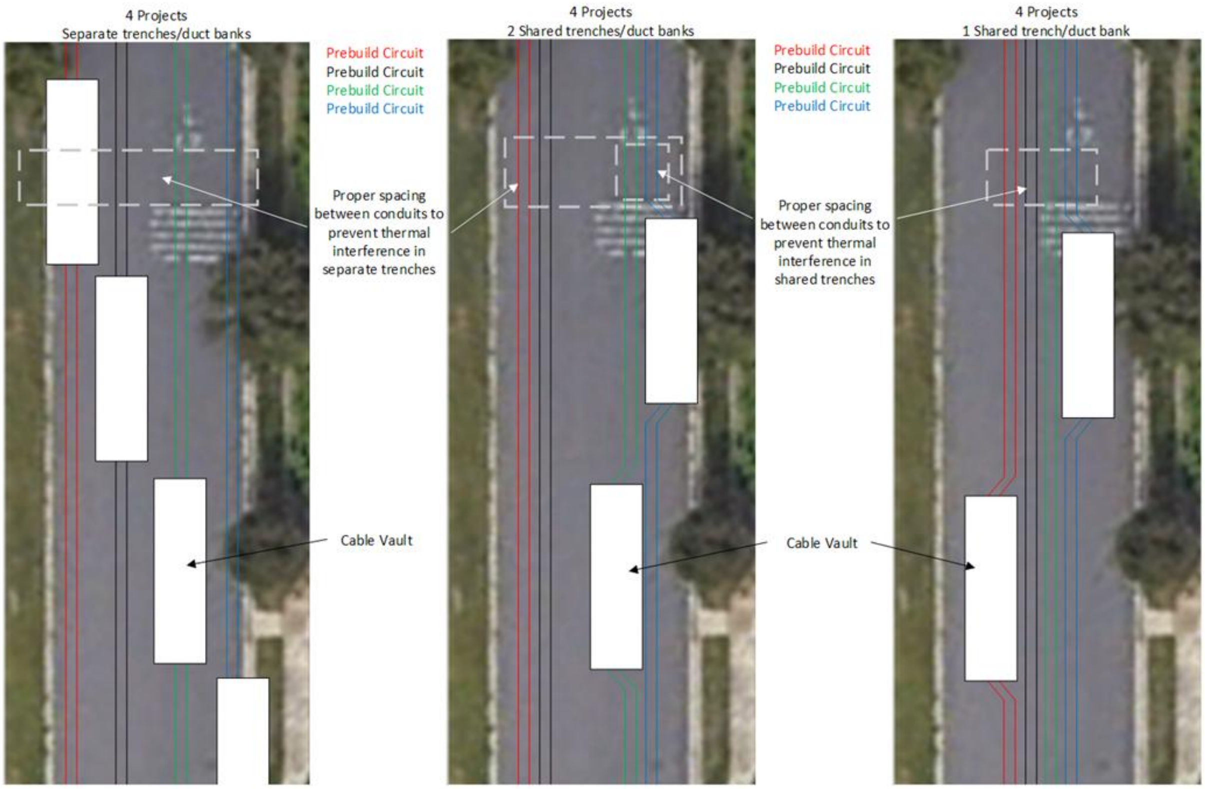

Figure B.10-1. Illustrative example of duct bank and cable vault layout

The PBI ROW is anticipated to occupy existing public roadways to a large extent. Based on the types of properties between Sea Girt and the Larrabee Collection Station and likely routes, the ROWs are expected to occupy the land uses summarized in Table B.10-1. Some categories overlap.

Table B.10-1. Affected land use categories along potential PBI routes

Land Use Category*	Single- Route Option (Miles)	Dual-Route Option (Miles)
Length	11	23
Public roads (municipal, county, state)	10	12
Bike path	2	3
Residential/private ownership	1	1.5
Forest	1.3	2.5
Wetland, including forested wetland	1.0	1.2
Parks and other open space	0.8	2
Water bodies	0.05	0.2

* All values are approximate and based on initial desktop assessments that must still be validated.

B.10.2 Description of In-water Activities

As noted in Table B.10-1, the onshore portion of the PBI could cross wetlands and waterbodies. It is expected that the majority of these features will be under the jurisdiction of the New Jersey Department of Environmental Protection (NJDEP). However, specific crossings of waters of the United States are also anticipated, including the crossing of the Manasquan River, and the landfall from the Atlantic Ocean to the Sea Girt NGTC.

The construction methodology used to cross the Manasquan River will depend on the selected PBI developer's construction plans and analysis of technical feasibility and environmental considerations. Proposed technical solutions to cross the Manasquan River under evaluation include HDD, direct bore, and use of a utility bridge.

The PBI continues seaward from the transition vaults at Sea Girt, through HDD boreholes, reaching offshore to the location of offshore cofferdams. Four transition vaults will be constructed at the onshore landfall location to accommodate the four future offshore wind circuits, as illustrated in Figure B.10-2. (Note: Figure B.10-2 presents a generalized image and does not reflect the total number of conduits expected to extend from the onshore transition vault to the offshore HDD exit pits). From the onshore transition vaults, a series of HDD bores (up to 10) will extend seaward to enable the placement of up to 10 conduits, which will ultimately house the offshore export cables for selected qualified offshore wind projects.

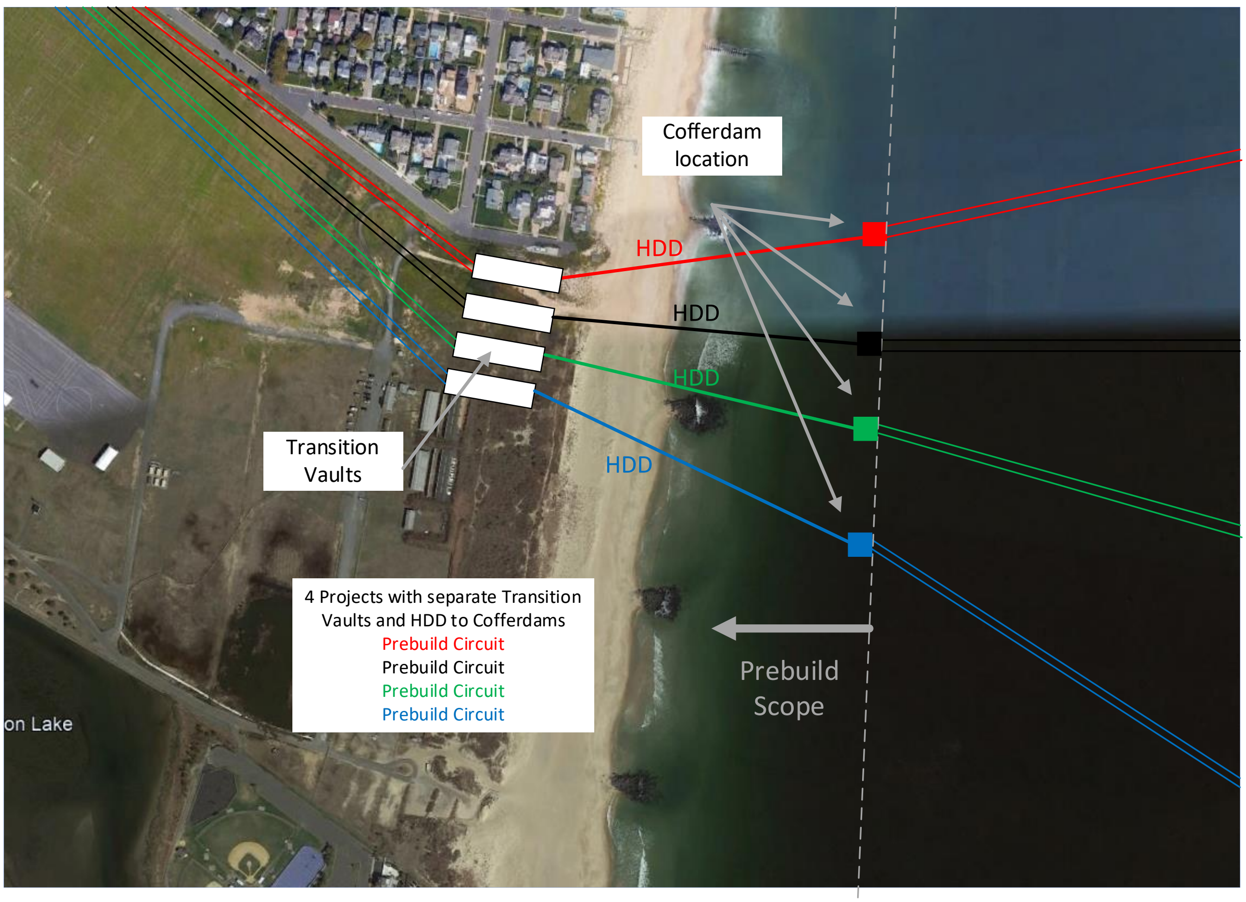

Figure B.10-2. Illustrative example of circuit arrangement at landfall

B.11 Transmission Infrastructure Development Efforts – New York

The New York City Public Policy Transmission Need process led by the New York Public Service Commission and the New York Independent System Operator (NYISO) issued a solicitation on April 4, 2024[8] for the submission of a proposed Public Policy Transmission Project or Other Public Policy Project that would 1) accommodate at least 4,770 MW of incremental offshore wind generation injected into New York City; 2) consist of complete end-to-end proposals composed of both offshore and onshore components; 3) include plans for how offshore wind generation would interconnect to the end-to-end transmission proposal at the offshore interconnection points, and 4) include demonstration plans to complete all permitting and construction activities necessary to achieve an in-service date no later than January 1, 2033.

The NYISO will conduct a multi-stage review of the project submissions and make a recommendation to the New York City Public Policy Transmission Need for consideration by the NYISO Board of Directors in 2025.

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[8] https://www.nyiso.com/documents/20142/40894368/New-York-City-Offshore-Wind-Public-Policy-Transmission-Need-Project-Solicitation.pdf/90f7cebe-e8f0-e094-1aa1-f61cc55dd84f

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B.12.5 Environmental Justice

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Appendix C: Tiering Guidance

The Bureau of Ocean Energy Management (BOEM) has prepared this Final Programmatic Environmental Impact Statement (PEIS) to evaluate the impacts that could result from wind energy development activities in the six New York Bight (NY Bight) lease areas, as well as the change in those impacts with avoidance, minimization, mitigation, and monitoring (AMMM) measures. The Proposed Action for the PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. BOEM may require some or all of these measures as conditions of approval for activities proposed by lessees in Construction and Operations Plans (COPs) submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. Project-specific National Environmental Policy Act (NEPA) analyses for individual COPs in the NY Bight lease areas could tier from or incorporate by reference this PEIS, in accordance with 40 Code of Federal Regulations (CFR) 1501.11-12. The project-specific NEPA analyses and consultations for each NY Bight lease area will focus on the impacts of approving a particular COP, including identification of additional AMMM measures that are best suited for consideration in the COP-specific NEPA analysis.

This appendix provides clarification on how BOEM anticipates using this PEIS to provide for greater efficiency and reduce duplication of analyses in complying with NEPA requirements for future, COP-specific NEPA analyses. The information in this appendix is organized by resource topic in a tabular format. For each resource topic, an overview of the affected environment, impact analysis, and AMMM measures in the PEIS is provided. For each of these components of the analysis, this appendix also provides recommendations for information from the PEIS that could be incorporated by reference into the future COP-specific NEPA analyses and identifies general information about additional analysis that BOEM anticipates would need to be performed as part of the COP-specific NEPA analysis once detailed and site-specific project information is available. BOEM may determine additional analysis is needed during the COP-specific NEPA process.

Table C-1. PEIS and COP-specific NEPA tiering guidance

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
Section 3.4.1, Air Quality and Greenhouse Gas Emissions	**Affected Environment.** Provides a discussion of the geographic analysis area, National Ambient Air Quality Standards (NAAQS), and attainment status of the area. PEIS Appendix B, *Supplemental Information and Additional Figures and Tables*, provides metocean and climate information and trends.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the relevant affected environment characterization in the PEIS. While it is anticipated that the geographic analysis area of a specific NY Bight lease area would be a subset of the geographic analysis area in the PEIS, additional characterization may be necessary if this is not the case. Additional characterizations of air quality in localized areas around onshore facilities will be warranted in the COP-specific NEPA analysis to the extent community-level air quality data are available.
	Impact Analysis. Provides quantitative analysis of project emissions, avoided health effects, social cost of greenhouse gases (GHGs), and a qualitative assessment of expected air quality/GHG impacts, based on generic or representative assumptions, for a highest-emissions scenario in accordance with the representative project design envelope (RPDE).	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the impact analysis in the PEIS. The COP-specific NEPA analysis should focus on what is unique about the project and how emissions and the locations of air quality impacts would differ from the PEIS. In addition, the COP-specific NEPA analysis should include quantitative modeling (dispersion and photochemical as applicable) to estimate ambient concentrations of criteria pollutants for comparison to the NAAQS and to assess impacts on Air Quality-Related Values. This modeling may be coordinated with the modeling required for the U.S. Environmental Protection Agency (USEPA) Outer Continental Shelf (OCS) air quality permit but should include all project emissions sources (not just those required for the permit). Air quality assessment for communities with environmental justice concerns affected by the project may also be appropriate.
	AMMM Measures. BOEM has not identified any AMMM measures for air quality**.**	**AMMM Measures.** The COP-specific NEPA analysis may include other project-specific measures to reduce impacts on air quality and greenhouse gas emissions, including a technical feasibility analysis of air quality Recommended Practices.
Section 3.4.2, Water Quality	**Affected Environment.** Provides a regional overview of the current water quality conditions within the geographic analysis area. Data are gathered from publicly available information such as the USEPA Coastal Condition Assessments and World Ocean Database, BOEM NEPA documents and environmental studies, scientific papers, and other COPs (e.g., sediment transport modeling from Empire Wind (OCS-A 0512)).	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the water quality affected environment characterization in the PEIS for the offshore project area only. For the onshore project area, the COP-specific NEPA analysis will need to characterize water quality specifically in all areas where onshore components could be sited, including the cable landfall(s), onshore export cable routes, points of interconnection (POI), substations, operations and maintenance (O&M) facilities, ports, above ground transmission lines, or any other infrastructure proposed in the onshore environment that will support the project. The information should include a description of the water quality conditions in the onshore project area. At a minimum, the data from the state Section 305(b) Water Quality Reports and Section 303(d) List of Impaired/Total Maximum Daily Load (TMDL) Waters should be included.
	Impact Analysis. Provides qualitative analysis of impacts on overall water quality by impact producing factor (IPF) (e.g.,	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS for the offshore project area; however

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	accidental releases, cable emplacement and presence of structures and discharges) based on the RPDE.	additional analysis such as sediment transport modeling associated with cable emplacement would be required to fully characterize the water quality impacts along the offshore export cable routes. In the onshore project area, the COP-specific NEPA analysis can incorporate by reference the general impacts on water quality associated with the IPFs. However, quantitative information is needed to address potential impacts associated with crossings of wetlands and waterbodies. This information would allow BOEM to provide a more accurate impact conclusion than that in the PEIS.
	AMMM Measures. Includes reducing potential for release of metal contaminants; submittal of oil spill response plan; submittal and approval of an anchoring plan to reduce or avoid impacts from turbidity and anchor placement; and training, recovery, prevention, and reporting to reduce and eliminate trash and debris.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended water quality AMMM measures specific to the IPFs. It would be expected that issuance of the Section 401 Water Quality Certificate from the state would include permit conditions including specific measures to avoid and minimize potential water quality impacts.
Section 3.5.1, Bats	**Affected Environment.** In the offshore environment, existing literature, and acoustic studies are used to describe bat species in the geographic analysis area. Bat information specific to the NY Bight lease areas is based on two New York State Energy Research and Development Authority (NYSERDA) meteorological buoys deployed in two of the NY Bight lease areas, as well as bat surveys conducted at nearby lease areas (e.g., Ocean Wind 1 (OCS-A 0498), Atlantic Shores South (OCS-A 0499), Empire Wind (OCS-A 0512)). Bat presence in the coastal onshore environment is primarily based on bat ranges that overlap with the coastal areas of New Jersey and New York.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the bats affected environment characterization in the PEIS for the offshore environment only. For the onshore environment, the COP-specific NEPA analysis will need to characterize habitats specifically in all areas where onshore components could be sited, including the offshore export cable landing(s), onshore export cable routes, POIs, substations, O&M facilities, ports, above ground transmission lines, or any other infrastructure proposed in the onshore environment that will support the project. The information should include a description of the forest habitat and acreage in the onshore project study area. At a minimum, an on-the-ground reconnaissance level field survey is recommended in order to map forest habitat at the onshore project components, including along all onshore export cable routes.
	Impact Analysis. In the offshore environment, the impact analysis is qualitative for the IPFs assessed. However, because current information on bat abundance/presence in the offshore environment indicates that bat presence is low, BOEM anticipates the exposure to any of the IPFs in the offshore environment to also be low, and, therefore, impacts on bats in the offshore environment are not anticipated to have any notable effect on bat populations. In the onshore environment, the impact assessment is qualitative and largely focuses on the land disturbance IPF. Because the types and locations of onshore project components are not known, there could be a range of impacts that are dependent upon the type and amount of habitat that could be	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS for the offshore environment. Because current information indicates low bat presence in the offshore environment, offshore development for the NY Bight lease areas would not be likely to have different impacts than those described in the PEIS. In the onshore environment, the COP-specific NEPA analysis can incorporate by reference the noise and presence of structures IPFs. However, quantitative information is needed to address potential impacts on bat habitat (forest areas). Ideally, the habitat areas mapped for the Affected Environment (see above) along with the potential locations of all onshore project components, would allow for a quantitative assessment of forest impacts. Forest impacts should also differentiate between permanent (complete removal or conversion) and temporary impacts, as well as potential tree trimming. This information would

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	removed (forest habitat is of primary concern for bats). While BOEM anticipates that bat habitat impacts in the onshore environment would be minimal due to likely siting of project components in already disturbed areas (based on recent wind projects BOEM is reviewing), it is still possible that areas of forested habitat would be altered or removed. Therefore, BOEM cannot rule out more substantial bat habitat impacts without project-specific information.	allow BOEM to provide a more accurate impact conclusion than that in the PEIS, which currently states a range due to the fact that this forest impact is unknown.
	AMMM Measures. Includes post-construction monitoring and injured or dead bat reporting.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended bats AMMM measures specific to the IPFs.
Section 3.5.2, Benthic Resources	**Affected Environment.** Provides a regional overview of the benthic resources present within the geographic analysis area. Data are gathered from publicly available information such as the Northeast Ocean Data Portal, the U.S. Geological Survey's (USGS's) SEABED database, seabed topography, habitat mapping, BOEM NEPA documents and environmental studies, scientific papers, and other COPs.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the benthic resources affected environment characterization in the PEIS. However, the COP-specific NEPA will need to characterize the specific benthic resources and habitats within the lease area (including along interarray cable routes) and along the offshore export cable routes, including acquiring benthic grab sampling and seafloor imagery consistent with BOEM's Benthic Habitat Survey Information Guidelines. This benthic information combined with multibeam and side scan sonar data would allow for accurate mapping and characterization of sediment types, benthic communities, and habitat types within the project area. These surveys could also include characterization and delineation of any submerged aquatic vegetation suspected to occur within nearshore and inshore project areas within export cable routes.
	Impact Analysis. Provides qualitative discussion of the typical types of impacts on benthic habitat from offshore wind developed based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS. The COP-specific NEPA analysis would need to include a quantitative impact analysis that includes the calculation of benthic habitats (acres) disturbed by each of the offshore activities associated by relevant IPFs (e.g., anchoring, cable emplacement, and presence of structures) associated with the offshore project area as well as any other project-specific analysis and modeling done (e.g., sediment transport modeling, electromagnetic fields emissions).
	AMMM Measures. Includes avoidance of boulders and minimization of boulder relocation distance to reduce alteration of the seabed; development and implementation of a Fisheries and Benthic Habitat Monitoring Plan; reduction and elimination of marine debris; submittal and approval of an anchoring plan to reduce or avoid impacts from turbidity and anchor placement; berm restoration to match natural contours; use of specific cable protection measures within complex hardbottom habitat	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended benthic resource AMMM measures specific to the project location.

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	to reduce impacts from cable emplacement on benthic resources; vessel anchoring and benthic sampling restrictions; cable and scour protection monitoring; soft start techniques during impact pile driving; and post-storm event monitoring.	
Section 3.5.3, Birds	**Affected Environment.** In the offshore environment, existing literature, modeling, and tracking information is used to describe bird species, abundance, and populations in the geographic analysis area. Bird information specific to the NY Bight lease areas is based on NYSERDA aerial digital surveys conducted between 2018 and 2019, and two NYSERDA meteorological buoys deployed in two of the NY Bight lease areas. Bird descriptions in the coastal onshore environment are very high level with little information on specific species or abundance due to unknown location of onshore project elements.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the bird affected environment characterization in the PEIS for the offshore environment only. For the onshore environment, the COP-specific NEPA analysis will need to characterize habitats specifically in all areas where onshore components could be sited, including the offshore export cable landing(s), onshore export cable routes, POIs, substations, O&M facilities, ports, above ground transmission lines, or any other infrastructure proposed in the onshore environment that will support the project. The information should include a description of the habitat types and amounts (e.g., acreages) in the onshore project study area, as well as identifying and describing any special habitat areas that are important to birds (e.g., sandy/dune beaches). At a minimum, an on-the-ground reconnaissance level field survey is recommended in order to map habitat types at the onshore project components, including along all onshore export cable routes.
	Impact Analysis. In the offshore environment, the impact analysis is largely qualitative for the IPFs assessed. The presence of structures IPF analysis does provide a conservative estimate of bird strike mortalities based on onshore wind farm data (where bird numbers are much higher). However, because current information shows bird abundance in the offshore environment to be low, BOEM anticipates the exposure to any of the IPFs in the offshore environment to also be low, and, therefore, impacts on birds in the offshore environment are not anticipated to have any notable effect on bird populations. In the onshore environment, the impact assessment is qualitative and largely focuses on the land disturbance IPF. Because the types and locations of onshore project components are not known, there could be a range of impacts that are dependent upon the type and amount of habitat that could be altered or removed. While BOEM anticipates that bird habitat impacts in the onshore environment would be minimal due to likely siting of project components in already disturbed areas (based on recent wind projects BOEM is reviewing), it is still possible that areas of higher quality habitat (e.g., forest) would be altered or removed. Therefore, BOEM cannot rule out more	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS for the offshore environment. Because current information indicates low bird presence in the offshore environment, offshore development for the NY Bight lease areas would not be likely to have different impacts than those described in the PEIS. For the presence of structures IPF, an estimate of bird mortality can be calculated with the number of wind turbine generators (WTGs) that are proposed for a specific lease area, but it will likely not change the ultimate impact assessment. In the onshore environment, the COP-specific NEPA analysis can incorporate by reference some of the qualitative impact analyses (e.g., noise, traffic [aircraft]). However, quantitative information is needed to address potential impacts to bird habitat (e.g., forest areas, sand/dune beach). Ideally, the habitat areas mapped for the Affected Environment (see above) along with the potential locations of all onshore project components, would allow for a quantitative assessment of habitat impacts. Habitat impacts should also differentiate between permanent (complete removal or conversion) and temporary impacts (e.g., cable placed in herbaceous areas that would regrow). This information would allow BOEM to provide a more accurate impact conclusion than that in the PEIS, which currently states a range due to the fact that this impact is unknown.

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	substantial bird habitat impacts without project-specific information.	
	AMMM Measures. Includes post-construction monitoring, dead or injured bird reporting, bird perching deterrents, measures to minimize light, and compensatory mitigation for Endangered Species Act (ESA) listed birds.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended bird AMMM measures specific to the project location. For example, the lessees could provide specific information on what equipment and technology would be used to limit and reduce light impacts.
Section 3.5.4, Coastal Habitat and Fauna	**Affected Environment.** Provides a regional overview of the coastal habitat and fauna present within the geographic analysis area. Data are gathered from publicly available information such as BOEM NEPA documents and environmental studies, scientific papers, and other COPs.	**Affected Environment.** Because the description of coastal habitat and fauna in the PEIS is regional, the COP-specific NEPA analysis will need to characterize specific coastal habitat and fauna within the onshore project areas based upon the location of onshore components. This characterization could include reconnaissance-level habitat and species surveys at the cable landfalls, onshore export cable routes, onshore substations, and POIs. Targeted habitat and species surveys would allow for accurate identification of beach nesting birds and sea turtles as well as ESA flowering plants within coastal habitats.
	Impact Analysis. Provides qualitative analysis of impacts on overall coastal habitat and fauna by IPF (e.g., accidental releases, noise, land disturbance, and traffic) based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference some of the qualitative impact analysis about the typical impacts from offshore wind development, and discuss any differences based upon project-specific details. However, because the analysis in the PEIS is regional, a more focused project-specific analysis will be needed based on the specific habitat types and flora and fauna present in the project area. The COP-specific NEPA analysis would need to include a quantitative impact analysis that includes the calculation of coastal areas (acres) disturbed by each of the onshore activities associated by relevant IPFs (e.g., cable emplacement and land disturbance). Ideally, the habitat areas mapped for the Affected Environment (see above) along with the potential locations of all onshore project components, would allow for a quantitative assessment of habitat impacts.
	AMMM Measures. BOEM has not identified any AMMM measures for coastal habitat and fauna**.**	**AMMM Measures.** The COP-specific NEPA analysis may include other project-specific measures to reduce impacts on coastal habitat and fauna.
Section 3.5.5, Finfish, Invertebrates, and Essential Fish Habitat	**Affected Environment.** Provides a regional overview of the finfish, invertebrates, and essential fish habitat (EFH) present within the geographic analysis area. Data are gathered from publicly available information such as the Marine Cadastre, Northeast Ocean Data Portal, National Oceanic and Atmospheric Administration (NOAA) Essential Fish Habitat Mapper, BOEM NEPA documents and environmental studies, scientific papers, and other COPs.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the finfish, invertebrates, and EFH affected environment characterization in the PEIS. However, the COP-specific NEPA analysis will need to characterize finfish, invertebrates, and EFH within the project lease area (including along interarray cable routes) and along the offshore export cable routes, including acquiring benthic grab sampling and seafloor imagery consistent with BOEM's Benthic Habitat Survey Information Guidelines. This benthic information combined with multibeam, and side scan sonar data would allow for accurate mapping and characterization of fish habitat types within the project area. In addition, any information on finfish from otter trawl surveys, gillnet or trammel net surveys, beam trawl surveys, fixed gear surveys with

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
		ventless traps, and shellfish surveys can inform this resource within the project area.
	Impact Analysis. Provides qualitative analysis of impacts on finfish, invertebrates, and EFH by IPF (e.g., cable emplacement, EMF, noise, and presence of structures) based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS and discuss any differences based upon project-specific details. The COP-specific NEPA analysis would need to include a quantitative impact analysis that includes the calculation of finfish, invertebrates, and EFH (acres) disturbed by each of the offshore activities associated by relevant IPFs (e.g., anchoring, cable emplacement, and presence of structures).
	AMMM Measures. Includes avoidance of boulders and minimization of boulder relocation distance to reduce alteration of the seabed; implementation of measures to minimize noise impacts; submittal and approval of an anchoring plan to reduce or avoid impacts from turbidity and anchor placement; restoring berms to match natural contours; incorporation of ecological design elements where practicable; monitoring of cables after installation; and implementation of post-storm event monitoring.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended finfish, invertebrates, and EFH AMMM measures specific to the project.
Section 3.5.6, Marine Mammals	**Affected Environment.** Provides a regional overview of the marine mammals present within the geographic analysis area. Data are gathered from publicly available information such as the Marine Cadastre, Northeast Ocean Data Portal, NMFS stock assessment reports, Atlantic Marine Assessment Program for Protected Species (AMAPPS), habitat-based density models, regional digital aerial baseline marine wildlife surveys, BOEM NEPA documents and environmental studies, scientific papers, and other COPs.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the regional marine mammal affected environment characterization in the PEIS. However, the COP-specific NEPA analysis will need to characterize the occurrence of marine mammals within the lease area and along the offshore export cable routes, including implementing surveys consistent with BOEM's Marine Mammals and Sea Turtles Information Guidelines. These surveys could include seasonal vessel-based and aerial surveys for determining spatial temporal distribution and abundance of marine mammal species and Passive Acoustic Monitoring (PAM) to gather ambient sound and presence of vocalizing marine mammals.
	Impact Analysis. Provides qualitative analysis of impacts on marine mammals by IPF (e.g., noise, presence of structures, and traffic) based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis would need to include a qualitative and quantitative impact analysis that includes the specific characterization of the intensity, geographic extent, frequency, and likelihood of impacts on marine mammals associated with each of the offshore activities associated by relevant IPFs (e.g., noise, presence of structures, and traffic). This impact analysis for marine mammals would include results from underwater acoustic modeling from proposed activities (e.g., pile-driving, unexploded ordnance [UXO], surveys) and from using BOEM's Risk Assessment to Model Encounter Rates Between Large Whales and Sea Turtles and Vessel Traffic from Offshore Wind Energy on the Atlantic OCS.
	AMMM Measures. Includes implementation of a long-term PAM monitoring system to reduce the risk of vessel strike and	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended marine mammal AMMM measures specific to the IPFs. It would

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	impacts from project activities (e.g., pile-driving); submittal and approval of Reduced Visibility Monitoring Plan (RVMP)/ Nighttime Pile Driving Monitoring Plan; protected species observer (PSO) requirements; measures to limit temporal and spatial extent of noise exposure; real-time and near-real-time monitoring to inform adaptive mitigation measures; trainings; collection of baseline information used to better anticipate potential impacts and further mitigate effects on marine mammals in the future; seasonal vessel speed requirements; measures to reduce marine debris and impacts from entanglement, ingestion, and pollutants; post-storm event monitoring; and reporting of potential takes of protected species.	be expected that issuance of the Incidental Harassment Authorizations or Letter of Authorizations for construction activities from NMFS would include permit conditions, including specific measures to avoid and minimize potential marine mammal impacts.
Section 3.5.7, Sea Turtles	**Affected Environment.** Provides a regional overview of the sea turtles present within the geographic analysis area. Data are gathered from publicly available information such as the Marine Cadastre, Northeast Ocean Data Portal, NMFS stock assessment reports, AMAPPS, habitat-based density models, regional digital aerial baseline marine wildlife surveys, BOEM NEPA documents and environmental studies, scientific papers, and other COPs.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the regional sea turtle affected environment characterization in the PEIS. However, the COP-specific NEPA analysis will need to characterize the occurrence of sea turtles within the lease area and along the offshore export cable routes, including implementing surveys consistent with BOEM's Marine Mammals and Sea Turtles Information Guidelines. These surveys could include seasonal vessel-based and aerial surveys for determining spatial temporal distribution and abundance of sea turtle species. Targeted habitat and species surveys would allow for accurate identification of nesting sea turtles, if any, suspected to occur along the offshore export cable routes and at landfall sites.
	Impact Analysis. Provides qualitative analysis of impacts on sea turtles by IPF (e.g., noise, presence of structures, and traffic) based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis would need to include a quantitative and qualitative impact analysis that includes the specific characterization of the intensity, geographic extent, frequency, and likelihood of impacts on sea turtles associated with each of the offshore activities associated by relevant IPFs (e.g., noise, presence of structures, and traffic). This impact analysis for sea turtles would include results from underwater acoustic modeling from proposed activities (e.g., pile-driving, UXO, surveys) and from using BOEM's Risk Assessment to Model Encounter Rates Between Large Whales and Sea Turtles and Vessel Traffic from Offshore Wind Energy on the Atlantic OCS.
	AMMM Measures. Includes submittal and approval of pile-driving monitoring plans; PSO requirements; measures to minimize vessel noise; measures to limit temporal and spatial extent of noise exposure; real-time and near–real-time monitoring to inform adaptive mitigation measures; trainings; collection of baseline information used to better anticipate potential impacts and further mitigate effects on sea turtles in	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended sea turtle AMMM measures specific to the IPFs.

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	the future; seasonal vessel speed requirements; measures to reduce marine debris and impacts from entanglement, ingestion, and pollutants; post-storm event monitoring; and reporting of potential takes of protected species.	
Section 3.5.8, Wetlands	**Affected Environment.** Wetlands in the geographic analysis area (which is limited to the onshore environment) are described using publicly available New Jersey and New York state wetland geographic information system (GIS) layers, as well as the National Wetlands Inventory (NWI). The geographic analysis area in the PEIS is much larger than the geographic analysis area of a specific NY Bight lease area.	**Affected Environment.** The COP-specific NEPA analysis will need to characterize wetlands specifically in all areas where onshore components could be sited, including the offshore export cable landing(s), onshore export cable routes, POIs, substations, O&M facilities, ports, or any other infrastructure proposed in the onshore environment that will support the project. The information should include a description of the wetland types and acreages in the onshore project study area, as well as information on the functions the wetlands may provide. At a minimum, an on-the-ground reconnaissance level field survey should be conducted in order to map all wetlands at the onshore project components, including along all onshore export cable routes. A wetland delineation would need to be conducted per the U.S. Army Corps of Engineers' wetland delineation manual where access can be obtained.
	Impact Analysis. The wetland impact assessment is qualitative and largely focuses on the land disturbance IPF. Because the types and locations of onshore project components are not known, there could be a range of wetland impacts that are dependent upon the type and amount of wetland that could be affected. While BOEM anticipates that wetland impacts would be minimal due to likely siting of project components in already disturbed areas (based on recent wind projects BOEM is reviewing), it is still possible that wetlands would be temporarily or permanently altered, or permanently filled. Therefore, BOEM cannot rule out more substantial wetland impacts without project-specific information.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the accidental releases IPF and the applicable qualitative analysis in the land disturbance IPF. However, quantitative information is needed to address potential impacts on wetlands. Ideally, the wetlands mapped for the Affected Environment (see above) along with the potential locations of all onshore project components would allow for a quantitative assessment of wetland impacts. The quantitative wetland impact analysis should also differentiate between permanent (wetland filling or conversion) and temporary impacts. This information would allow BOEM to provide a more accurate impact conclusion than that in the PEIS, which currently states a range due to the unknown locations of onshore project components and wetlands.
	AMMM Measures. No AMMM measures specific to wetlands are included in the PEIS.	**AMMM Measures.** The COP-specific NEPA analysis may include other project-specific measures to reduce impacts on wetlands.
Section 3.6.1, Commercial Fisheries and For-Hire Recreational Fishing	**Affected Environment.** Provides a regional overview of the commercial fisheries and for-hire recreational fishing within the geographic analysis area. Data are gathered from publicly available information such as the Marine Cadastre, Northeast Ocean Data Portal, NMFS Commercial Fisheries Landings Statistics, NMFS Descriptions of Selected Fishery Landings and Estimates of Vessel Revenue from Areas, NMFS Landing and Revenue Data for Wind Energy Areas, NMFS Recreational	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the commercial fisheries and for-hire recreational fishing affected environment characterization in the PEIS. However, the COP-specific NEPA analysis will need to characterize commercial fisheries and for-hire recreational fishing within each lease area (including along interarray cable routes) and along the offshore export cable routes, including acquiring fishery information consistent with BOEM's Fishery Information Guidelines. This could include data from otter trawl surveys, gillnet or trammel net surveys, beam trawl surveys, fixed gear surveys with ventless traps, and shellfish surveys.

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	Fisheries Statistics Queries, BOEM NEPA documents and environmental studies, scientific papers, and other COPs.	
	Impact Analysis. Provides qualitative analysis of resource and socioeconomic impacts on commercial fisheries and for-hire recreational fishing by IPF (e.g., cable emplacement, EMF, noise, and presence of structures) based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis would need to include a qualitative impact analysis that incorporates the characterization of impacts on commercial fisheries and for-hire recreational fishing associated with each of the offshore activities by relevant IPFs (e.g., cable emplacement, EMF, noise, and presence of structures). This impact analysis for commercial fisheries and for-hire recreational fishing would include the socioeconomic effects on fishing vessel maneuverability, reduction in fishing activities and fishing revenue, entanglement and damage or loss of commercial and recreational fishing gear, and an estimate of the amount of commercial fishing revenue that would be "exposed."
	AMMM Measures. Includes avoidance of boulders and minimization of boulder relocation distance to reduce alteration of the seabed; implementation of a Scour and Cable Protection Plan; execution of a Fisheries and Benthic Habitat Monitoring Plan that includes shellfish, such as surfclam and scallop; compensation to commercial and for-hire recreational fishermen for gear loss and loss of income due to unrecovered economic activity; compensation to shoreside businesses for losses indirectly related to the expected development; and post-storm event monitoring.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended commercial fisheries and for-hire recreational fishing AMMM measures specific to the IPFs.
Section 3.6.2, Cultural Resources	**Affected Environment.** Provides a regional overview of the cultural context and resource types in the geographic analysis area and any knowable, individual historic properties identified in a Programmatic Area of Potential Effects (APE) developed for National Historic Preservation Act (NHPA) reviews of the six NY Bight lease areas. Data are gathered from the 2021 NY Bight Environmental Assessment and NY Bight *NHPA Section 106 Summary* (Appendix I).	**Affected Environment.** The COP-specific NEPA and NHPA analysis will need to identify and characterize cultural contexts, cultural resource types, and specific historic properties in a project-specific geographic analysis area and APE. This includes completion of associated cultural resource and historic property identification efforts per BOEM guidelines. Identification of cultural resources and historic properties would allow for accurate impact analysis and development and implementation of AMMM measures.
	Impact Analysis. Provides qualitative analysis of impacts on cultural resources overall by IPF (i.e., accidental releases, anchoring, cable emplacement and maintenance, survey gear utilization, land disturbance, lighting, and presence of structures) based on the RPDE. Qualitative analysis is supported by limited quantitative data derived from BOEM's background research on the affected environment.	**Impact Analysis.** The COP-specific NEPA and NHPA analysis would need to include both a qualitative and quantitative analysis of impacts on the specific cultural resources and historic properties identified in the project-specific geographic analysis area and APE. Impact analysis would involve NHPA consultations with State Historic Preservation Officers (SHPOs), federally recognized Tribes, lessees, and other identified consulting parties to sufficiently assess effects on historic properties identified in a COP-specific APE. Identification of and assessments of effects on historic properties are required to develop and implement AMMM measures.

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	AMMM Measures. Includes requirements to establish and comply with marine cultural resource avoidance buffers, implement monitoring and post-review discovery plans for marine and terrestrial resources, and avoid terrestrial archaeological resources.	**AMMM Measures.** The COP-specific NEPA and NHPA analysis would include AMMM measures to avoid, reduce, or resolve adverse effects on historic properties as agreed upon by federally recognized Tribes, Advisory Council on Historic Preservation (ACHP), SHPOs, lessees, and other consulting parties. The AMMM measures may include those identified in the PEIS and additional measures identified during the COP-specific NEPA and NHPA process.
Section 3.6.3, Demographics, Employment, and Economics	**Affected Environment.** Provides a county-level overview of population, housing and employment data from the U.S. Census Bureau and NOAA.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the relevant affected environment characterization in the PEIS. While it is anticipated that the geographic analysis area of a specific NY Bight lease area would be a subset of the geographic analysis area in the PEIS, additional county-level characterization may be necessary if this is not the case. Additionally, depending on the timing of the COP-specific NEPA document, it may be warranted to provide more recent data than what is provided in the PEIS. More detailed community-level characterizations of populations with the potential to be affected by specific landings or cable routes, POIs, O&M facilities, or port utilization will be warranted in the COP-specific NEPA analysis.
	Impact Analysis. Provides qualitative analysis of impacts and benefits of development of offshore wind projects on populations, employment, and the economy based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS. This analysis should focus on what is unique about the project and how it is different from what is discussed in the PEIS. Additionally, an economic analysis using quantitative modeling is warranted to support the COP-specific NEPA analysis. This analysis would provide: • Estimates of direct, indirect, induced jobs by project phase during construction and operations. • Estimates of economic benefits (Gross Domestic Product) generated by project phase during construction and operations. • Estimate of local expenditures during construction and operations. • Estimates of economic benefits associated with tax revenue (local, state, and federal) during construction.
	AMMM Measures. No AMMM measures specific to demographics, employment, and economics are included in the PEIS.	**AMMM Measures.** The COP-specific NEPA analysis may include other project-specific measures to reduce impacts on demographics, employment, and economics. If applicable, the analysis should provide descriptions of any local commitments or investments in workforce training and development to support the offshore wind industry.
Section 3.6.4, Environmental Justice	**Affected Environment.** Provides a county-level overview of low-income and minority populations in the geographic analysis area based on data from the U.S. Census Bureau. Provides county-level mapping of the commercial and recreational fishing engagement or reliance of coastal communities based on	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the relevant affected environment characterization in the PEIS. While it is anticipated that the geographic analysis area of a specific NY Bight lease area would be a subset of the geographic analysis area in the PEIS, additional county-level characterization may be necessary if this is not the case. Additionally,

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	NOAA's social indicator tool and provides a description of the social stressors experienced by low-income or minority populations in coastal communities. Identifies tribal communities within the geographic analysis area.	depending on the timing of the COP-specific NEPA document, it may be warranted to provide more recent data than what is provided in the PEIS. More detailed community-level characterizations of low-income and minority populations with the potential to be affected by specific landings or cable routes, POIs, O&M facilities, or port utilization will be necessary for the COP-specific NEPA analysis.
	Impact Analysis. Provides qualitative analysis of impacts and benefits of development of offshore wind projects on populations with environmental justice concerns based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS. The analysis should focus on what is unique about the project and how it is different from what is discussed in the PEIS. Site-specific analysis of the project impacts on populations with environmental justice concerns in areas surrounding ports, cable landings, substations, onshore construction, O&M facilities, or any other infrastructure proposed in the onshore environment that will support the project will be necessary for the COP-specific NEPA analysis. For example, potential changes in vehicle traffic near selected ports will need to be analyzed in the COP-specific NEPA analysis. The analysis will incorporate more detailed impact analyses by resource topic (e.g., project-level air quality assessments for populations with environmental justice concerns affected by the project). The COP-specific NEPA analysis will analyze and provide a determination as to whether the project has disproportionately high and adverse human health or environmental effects on low-income and minority populations when compared to the project's effect on the overall population.
	AMMM Measures. Includes the creation and reporting of an environmental justice communications plan for lessees to communicate with communities with environmental justice concerns during activities described in the COP, including construction, operations, and decommissioning	**AMMM Measures.** The COP-specific NEPA analysis may include other project-specific measures to reduce impacts on communities with environmental justice concerns.
Section 3.6.5, Land Use and Coastal Infrastructure	**Affected Environment.** Provides a regional overview of the potentially affected onshore areas, the areas where representative ports are located, and the areas closest to the NY Bight lease areas that may be affected by construction and O&M.	**Affected Environment.** Site-specific level characterizations of land use and coastal infrastructure (e.g., zoning, county/municipal-level plans) in areas surrounding ports, cable landings, substations, onshore construction, O&M facilities, or any other infrastructure proposed in the onshore environment that will support the project will be warranted with COP-specific NEPA analysis.
	Impact Analysis. Provides a qualitative analysis of the typical impacts and benefits associated with onshore development of offshore wind projects on land use and coastal infrastructure such as port improvement and expansion, vehicle traffic, and visibility of offshore structures. Because the location of onshore infrastructure is not yet known, the analysis is general and not location specific.	**Impact Analysis.** Site-specific analysis of project impacts on land use and coastal infrastructure in areas surrounding ports, cable landings, substations, onshore construction, O&M facilities or any other infrastructure proposed in the onshore environment that will support the project will be necessary for the COP-specific NEPA analysis. For example, the analysis will need to describe the specific locations that would be affected, the acreage of disturbance, and consistency with local zoning and other ordinances (e.g., noise requirements).

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
	AMMM Measures. Includes the creation and reporting of an environmental justice communications plan for lessees to communicate with communities with environmental justice concerns during activities described in the COP, including construction, operations, and decommissioning.	**AMMM Measures.** The COP-specific NEPA analysis may include other project-specific measures to reduce impacts on land use and coastal infrastructure.
3.6.6, Navigation and Vessel Traffic	**Affected Environment.** Provides an overview of the current navigational setting for shipping and other maritime users in the geographic analysis area, including shipping channels, traffic schemes and fairways, and historical vessel traffic volumes within each NY Bight lease area based on 3 years of Automatic Identification System data.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the relevant affected environment characterization in the PEIS. While the geographic analysis area of a specific NY Bight lease would be a subset of the geographic analysis area in the PEIS, additional characterization may be necessary depending on the location of export cable routes and the location of ports to be used by the projects. Information from the COP-specific Navigation Safety Risk Assessment (NSRA) would be used to supplement the information in the PEIS related to vessel traffic and safety (e.g., search and rescue incident data, accident frequency data). The NSRA should include Automatic Identification System data and collision/allision risk.
	Impact Analysis. Provides a qualitative analysis of the impacts associated with the development of the NY Bight projects based on the location of the lease areas, including impacts from structures, increased vessel traffic, and cable placement. Analysis uses information from COPs of nearby projects to quantitatively estimate project vessel traffic and projected increases in accident frequencies.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS. The additional analysis should focus on what is unique about the project and how it is different from what is discussed in the PEIS based on the site-specific location, project details, and the assessment provided in the NSRA in accordance with NVIC 02-2023. The analysis should provide additional discussion regarding the following project-specific details: • Anchoring plans. • NSRA analysis results of the potential increases in accident frequencies. • Cable route locations and construction methods and timing. • Port utilization. • Number of WTG/OSS, spacing/layout, and construction methods and timing. • Project vessel traffic. Additional analysis of cable routes and their proximity to Federal Aids to Navigation would occur at the project-specific level.
	AMMM Measures. Includes boulder relocation reporting and seeking to avoid unfavorable cable placement in Federal Aids to Navigation (ATONs), Private Aids to Navigation (PATONs), anchorage areas, Traffic Separation Schemes (TSSs), and fairways.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended navigation and vessel traffic AMMM measures specific to the project location. For example, the lessees could provide details regarding avoiding cable placement in unfavorable areas.
3.6.7, Other Uses (Marine Minerals,	**Affected Environment.** Provides an overview of the current marine minerals extraction, national security and military use, aviation and air traffic, cables and pipelines, radar systems, and	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the relevant affected environment characterization in the PEIS. While it is anticipated that the geographic analysis area of a specific NY Bight lease area

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
Military Use, Aviation, Scientific Research and Surveys)	scientific research and surveys in the geographic analysis area. Data are gathered from publicly available information from the Marine Minerals Information System, Mid-Atlantic Regional Council on the Ocean, and Northeast Regional Ocean Council.	would be a subset of the geographic analysis area in the PEIS, additional site-specific characterization may be necessary, especially regarding proposed offshore export cable routes and landfall locations. Site-specific characterization of other uses potentially affected by existing cables, national security and military uses, radar systems, and scientific research and surveys in the vicinity of the geographic analysis area will be warranted with COP-specific NEPA analysis.
	Impact Analysis. Provides an analysis of the impacts associated with the development of offshore wind projects on other uses, including accessibility of marine mineral borrow areas, navigational traffic, and radar interference.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the impact analysis in the other uses section of the PEIS. This analysis should focus on what is unique about the project and how it is different from what is discussed in the PEIS. For example, the analysis should include a discussion of impacts from cable routes and a quantitative assessment of the potential interference of WTGs with radar systems, national security and military uses, and scientific research and surveys.
	AMMM Measures. Includes mitigation agreements for radar systems, infrastructure removal at decommissioning in marine minerals resource areas, and a survey mitigation agreement between NMFS and the lessee.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended other uses AMMM measures specific to the project location. If applicable, the lessees should provide descriptions of any planned mitigation to decrease radar interference as a result of coordination with radar operators and avoid or minimize impacts on marine mineral resources.
3.6.8, Recreation and Tourism	**Affected Environment.** Provides a county-level description of recreation and tourism and recreational fishing activities in the geographic analysis area based on data from NOAA and other state and local sources.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the recreation and tourism affected environment characterization in the PEIS. However, the COP-specific NEPA analysis will need to characterize recreation and tourism and recreational fishing within the lease area (including along interarray cable routes), along the offshore export cable routes, and in areas surrounding cable landings, substations, onshore construction, O&M facilities, or any other infrastructure proposed in the onshore environment.
	Impact Analysis. Provides qualitative analysis of impacts and benefits of development of offshore wind projects on recreation and tourism and recreational fishing based on the RPDE.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the qualitative impact analysis in the PEIS. The analysis should focus on what is unique about the project and how it is different from what is discussed in the PEIS. Site-specific analysis of the project impacts on recreation and tourism and recreational fishing activities in the lease area, along the offshore export cable routes, and in areas surrounding cable landings, substations, onshore construction, O&M facilities, or any other infrastructure proposed in the onshore environment that will support the project will be necessary for the COP-specific NEPA analysis.
	AMMM Measures. Includes a measure to minimize nighttime lighting associated with aviation obstruction lights.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended recreation and tourism AMMM measures specific to the project location. For example, the lessees could provide specific information on what construction windows, equipment, or technology would be used to limit and reduce light and other impacts.

PEIS Section	Overview of Programmatic EIS Content	Additional Analysis for COP-Specific NEPA Analysis
3.6.9, Scenic and Visual Resources	**Affected Environment.** Provides mapping and descriptions of seascape character area, open ocean character area, and landscape character area and key observation points.	**Affected Environment.** The COP-specific NEPA analysis can incorporate by reference the relevant affected environment characterization in the PEIS for the offshore environment. The COP-specific NEPA analysis would incorporate additional mapping and descriptions of seascape character area, open ocean character area, and landscape character area and key observation points developed specifically for the COP. The COP-specific NEPA analysis would need to provide location-specific characterization of the onshore environment based upon where the proposed landfalls, onshore cable routes, substations, and O&M facilities would be sited.
	Impact Analysis. Provides mapping and descriptions of project viewsheds for each of the six lease areas and for the six lease areas combined and presents impacts on seascape character area, open ocean character area, and landscape character area and key observation points from offshore structures. Impacts from onshore infrastructure are discussed qualitatively and are not location specific.	**Impact Analysis.** The COP-specific NEPA analysis can incorporate by reference the analysis of impacts on seascape character area, open ocean character area, and landscape character area and key observation points by lease area from offshore structures. The analysis should describe how the impacts would differ from those in the PEIS based on different turbine heights and layout and may include project-specific visual simulations. For the onshore environment, the COP-specific NEPA analysis would need to assess impacts on landscape character area and key observation points from onshore facilities, such as substations.
	AMMM Measures. Includes measures to minimize nighttime lighting associated with aviation obstruction lights and a monitoring plan to compare the visual effects of a wind farm to the findings in the COP Visual Impact Assessment.	**AMMM Measures.** The COP-specific NEPA analysis would include the recommended scenic and visual resources AMMM measures specific to the project location.

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Appendix D: Planned Activities Scenario

Contents

List of Tables

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D.1 Ongoing and Planned Activities Scenario

This appendix describes the other ongoing and planned activities that could occur within the geographic analysis area for each resource and potentially contribute to baseline conditions and trends for resources considered in the Final Programmatic Environmental Impact Statement (PEIS). The baseline conditions and trends described here serve as the basis for analysis of the No Action Alternative and cumulative impacts. The analysis of the action alternatives includes the potential biological, socioeconomic, physical, and cultural impacts that could result from wind energy development activities in the six New York Bight (NY Bight) lease areas, as well as the change in those impacts that could result from implementing avoidance, minimization, mitigation, and monitoring (AMMM) measures for the NY Bight lease areas.

The geographic analysis area varies for each resource as described in the individual resource sections of Chapter 3, *Affected Environment and Environmental Consequences*. Impacts could occur from the start of construction of the NY Bight projects through decommissioning. The Bureau of Ocean Energy Management (BOEM) anticipates that construction of the NY Bight projects would begin between 2026 and 2030. The decommissioning phase is anticipated to be around 35 years after construction is completed. The geographic analysis area is defined by the anticipated geographic extent of impacts for each resource. For the mobile resources—bats, birds, finfish and invertebrates, marine mammals, and sea turtles—the species potentially affected are those that occur within the area of impact of the NY Bight projects. The geographic analysis area for these mobile resources is the general range of the species. The purpose is to capture the cumulative impacts on each of those resources that would be affected by the six NY Bight projects as well as the impacts that would still occur under the No Action Alternative.

In this appendix, distances in miles are in statute miles (miles used in the traditional sense) or nautical miles (miles used specifically for marine navigation). This appendix uses statute miles more commonly and refers to them simply as *miles*, whereas nautical miles (nm) are referred to by name.

D.2 Ongoing and Planned Activities

This section includes a list and description of ongoing and planned activities that could contribute to baseline conditions and trends within the geographic analysis area for each resource topic analyzed in the Final PEIS. Projects or actions that are considered speculative per the definition provided in 43 Code of Federal Regulations (CFR) 46.30[1] are noted in subsequent tables but excluded from the cumulative impact analysis in Chapter 3.

Ongoing and planned activities and environmental stressors described in this section consist of: (1) other offshore wind energy development activities; (2) undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); (3) tidal energy projects; (4) dredging and port improvement projects; (5) marine minerals use and ocean-dredged material disposal; (6) military use; (7) marine transportation; (8) fisheries use, management, and monitoring surveys; (9) global climate change; (10) oil and gas activities; and (11) onshore development activities.

BOEM analyzed the possible extent of other planned offshore wind energy development activities on the Atlantic Outer Continental Shelf (OCS) to determine reasonably foreseeable cumulative effects measured by installed power capacity. Table D2-1 in Attachment D2 represents the status of projects as of August 2024. The methodology for developing the planned activities scenario is the same as for the Vineyard Wind 1 (OCS-A 0501) project and details of the scenario development are described in the Vineyard Wind 1 Final Environmental Impact Statement (EIS) (BOEM 2021a).

D.2.1 Offshore Wind Energy Development Activities

D.2.1.1 Site Characterization Studies

A lessee is required to provide the results of site characterization activities with its site assessment plan (SAP)[2] and Construction and Operations Plan (COP). For the purposes of the cumulative impact analysis, BOEM makes the following assumptions, which represent the maximum-case scenario for survey and sampling activities:

- Site characterization would occur on all existing leases and potential export cable routes.
- Site characterization would likely take place in the first 3 years following execution of a lease, based on the fact that a lessee would likely want to generate data for its COP at the earliest possible opportunity.
- Lessees would likely survey most or all of their lease areas during the 5-year site assessment term to collect required geophysical information for siting of a meteorological tower, two buoys, and

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[1] 43 CFR 46.30 – Reasonably foreseeable planned actions include those federal and non-federal activities not yet undertaken, but sufficiently likely to occur, that a responsible official of ordinary prudence would take such activities into account in reaching a decision. The federal and non-federal activities that BOEM must take into account in the analysis of cumulative impacts include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by BOEM. Reasonably foreseeable planned actions do not include those actions that are highly speculative or indefinite.

[2] On May 15, 2024, BOEM issued the final Renewable Energy Modernization Rule (89 *Federal Register* 42602), which among other things eliminated the site assessment plan requirement for met buoys, which are most commonly used for site assessment activities. However, met buoys would continue to require U.S. Army Corps of Engineers (USACE) permits given the USACE's jurisdiction over obstructions deployed in U.S. navigable waters under Section 10 of the Rivers and Harbors Act.

commercial facilities (wind turbines). The surveys may be completed in phases, with the meteorological tower and buoy areas likely to be surveyed first.

- Lessees would not use air guns, which are typically used for deep-penetration, two-dimensional or three-dimensional exploratory seismic surveys to determine the location, extent, and properties of oil and gas resources (BOEM 2016).

Table D-1 describes the typical site characterization surveys, the types of equipment and method used, and which resources the survey information would inform.

Table D-1. Site characterization survey assumptions[1]

Survey Type	Survey Equipment and Method	Resource Surveyed or Information Used to Inform
HRG surveys	Side-scan sonar, sub-bottom profiler, magnetometer, multi-beam echosounder	Shallow hazards, archaeological, bathymetric charting, benthic habitat
Geotechnical/sub-bottom sampling	Vibracores, deep borings, cone penetration tests	Geological, marine archaeology
Biological	Grab sampling, benthic sled, underwater imagery/sediment profile imaging	Benthic habitat
	Aerial digital imaging; visual observation from boat or airplane	Birds, marine mammals, sea turtles
	Ultrasonic detectors installed on survey vessels used for other surveys	Bats
	Visual observation from boat or airplane	Marine fauna (marine mammals and sea turtles)
	Direct sampling of fish and invertebrates	Fish and invertebrates

Source: BOEM 2016.

[1] The May 15, 2024 Renewable Energy Modernization Rule defers and extends the required time periods for meeting certain geotechnical survey requirements, such as engineering site-specific surveys (e.g., boreholes, vibracores, grab samplers, cone penetrometer tests, and other penetrative methods), until after COP approval but before construction.

D.2.1.2 Site Assessment Activities

After SAP approval, a lessee can evaluate the meteorological conditions, such as wind resources, with the approved installation of meteorological towers and buoys. Meteorological buoys have become the preferred meteorological and oceanographic (metocean) data collection platform for developers, and BOEM expects that most future site assessments will use buoys instead of towers (BOEM 2021d). The installation and operation of meteorological buoys involves substantially less activity and a much smaller footprint than the construction and operation of a meteorological tower. Site assessment activities have been approved or are in the process of being approved for multiple lease areas on the OCS consisting of one to three meteorological buoys per SAP (Table D2-1 in Attachment D2). Site assessment would likely take place starting within 1 to 2 years of lease execution, because preparation of a SAP (and subsequent BOEM review) takes time. The No Action Alternative and cumulative analyses consider these site assessment activities.

D.2.1.3 Construction and Operation of Offshore Wind Facilities

Table D-2 depicts construction of offshore wind projects from Maine to South Carolina.[3] Also included are all the projects currently in various stages of planning within BOEM's offshore leases from Massachusetts to South Carolina. Projected construction dates for each offshore wind project are listed in Table D2-1 in Attachment D2, and each project will require a National Environmental Policy Act (NEPA) process with an EIS or environmental assessment prior to approval.

Table D-2 summarizes (1) the incremental number of construction locations that are projected to be active in each region during each year between 2023 and 2030; (2) the number of operational turbines in each region at the beginning of each year between 2021 and 2030; and (3) the total number of active construction locations and operational turbines across the Atlantic OCS by year.

BOEM assumes planned offshore wind projects will include the same or similar components as the NY Bight projects: wind turbine generators (WTGs), offshore and onshore cable systems, offshore substations (OSSs), onshore operations and maintenance (O&M) facilities, and onshore interconnection facilities. BOEM further assumes that other planned offshore wind projects will employ the same or similar construction and installation, O&M, and conceptual decommissioning activities as the NY Bight projects. However, offshore wind projects would be subject to evolving economic, environmental, and regulatory conditions. Lease areas may be split into multiple projects, expanded, or removed, and development within a particular lease area may occur in phases over long periods of time. Research currently being conducted in combination with data gathered regarding physical, biological, socioeconomic, and cultural resources during development of initial offshore wind projects in the United States could affect the design and implementation of future projects, as could advancements in technology. For the analysis of ongoing and planned activities, the ongoing and planned projects included in Table D2-1 in Attachment D2 are analyzed in Chapter 3 of the Final PEIS.

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[3] Within this Draft PEIS, BOEM analyzes Ocean Wind 1 (OCS-A 0498) as an ongoing offshore wind project and Ocean Wind 2 (OCS-A 0532) as a planned offshore wind project. On October 31, 2023, Orsted publicly announced their decision to cease development of Ocean Wind 1 and Ocean Wind 2. However, Ocean Wind LLC (the lessee for Ocean Wind 1) has not withdrawn their COP for lease OCS-A 0498, and so BOEM has analyzed the project as described in the approved COP. On February 29, 2024, pursuant to 30 CFR § 585.418, BOEM approved a 2-year suspension of the operations term of Ocean Wind LLC's commercial lease (Renewable Energy Lease Number OCS-A 0498), lasting until February 28, 2026. This suspension was approved in response to the lessee's January 19, 2024, request for a suspension of the operations term for the lease, submitted pursuant to Section 8(p)(5) of the Outer Continental Shelf Lands Act, 43 U.S Code § 1337(p)(5) and BOEM's implementing regulations at 30 CFR § 585.416. Orsted North America Inc. (the lessee for Ocean Wind 2) has not relinquished or reassigned lease OCS-A 0532; therefore, BOEM has analyzed development of the lease area consistent with the assumptions identified in this appendix.

In January 2024, Empire Offshore Wind, LLC (the lessee for Empire Wind 1 and 2) announced it was terminating the Offshore Wind Renewable Energy Certificate (OREC) Agreement for the Empire Wind 2 project. Empire Offshore Wind, LLC has not informed BOEM of any material changes to the activities approved in its COP. Therefore, BOEM has analyzed development of the lease area in this Final PEIS consistent with the assumptions identified in Appendix D.

Table D-2. Offshore wind project construction schedule (dates shown as of August 2024)[1]

Project/Region	Number of Foundations: Before 2021	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030 and Beyond
NE Aqua Ventus (Maine state waters)	-	-	-	-	-	2	-	-	-	-	-
Total Other State Waters Projects	-	-	-	-	-	2	-	-	-	-	-
Estimated Other State Waters Construction Total	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
Estimated O&M Total	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**2**	**2**	**2**
EXISTING AND ONGOING PROJECTS											
Block Island (Rhode Island state waters)	5	-	-	-	-	-	-	-	-	-	-
Vineyard Wind 1, part of OCS-A 0501	-	-	-	-	63	-	-	-	-	-	-
South Fork Wind, OCS-A 0517	-	-	-	13	-	-	-	-	-	-	-
CVOW-Pilot, OCS-A 0497	2	-	-	-	-	-	-	-	-	-	-
Revolution Wind, part of OCS-A 0486	-	-	-	-	67	-	-	-	-	-	-
Ocean Wind 1, OCS-A 0498	-	-	-	-	-	-	101	-	-	-	-
Sunrise Wind, OCS-A 0487	-	-	-	-	95	-	-	-	-	-	-
New England Wind, OCS-A 0534 and portion of OCS-A 0501 remainder (Phase 1 [i.e., Park City Wind])[2]	-	-	-	-	-	64	-	-	-	-	-
New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[2]	-	-	-	-	-	66	-	-	-	-	-
Empire Wind 1, part of OCS-A 0512	-	-	-	-	55	-	-	-	-	-	-
Empire Wind 2, part of OCS-A 0512	-	-	-	-	-	-	85	-	-	-	-
CVOW-Commercial, OCS-A 0483	-	-	-	-	179	-	-	-	-	-	-
Estimated Existing and Ongoing Project Construction Total	**7**	**0**	**0**	**13**	**459**	**130**	**186**	**0**	**0**	**0**	**0**
Estimated O&M Total	**0**	**7**	**7**	**7**	**20**	**479**	**609**	**795**	**795**	**795**	**795**

Project/Region	Number of Foundations										
	Before 2021	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030 and Beyond
PLANNED PROJECTS											
Massachusetts/Rhode Island Region											
SouthCoast Wind, OCS-A 0521	-	-	-	-	-	149	-	-	-	-	-
Beacon Wind 1, part of OCS-A 0520[3]	-	-	-	-	-	-	78	-	-	-	-
Beacon Wind 2, part of OCS-A 0520[3]	-	-	-	-	-	-	-	79	-	-	-
Bay State Wind, part of OCS-A 0500	-	-	-	-	-	-	96	-	-	-	-
OCS-A 0500 remainder	-	-	-	-	-	-	119	-	-	-	-
OCS-A 0487 remainder	-	-	-	-	-	-					
Vineyard Wind NE, OCS-A 0522	-	-	-	-	-	-	-	160	-	-	-
Estimated Annual Massachusetts/Rhode Island Construction	**0**	**0**	**0**	**0**	**0**	**149**	**293**	**239**	**0**	**0**	**0**
Estimated O&M Total	**0**	**0**	**0**	**0**	**0**	**0**	**149**	**442**	**681**	**681**	**681**
New York/New Jersey Region											
Atlantic Shores South, OCS-A 0499	-	-	-	-	-	-	197	-	-	-	-
Atlantic Shores North, OCS-A 0549	-	-	-	-	-	-	-	-	-	158	-
Ocean Wind 2, OCS-A 0532	-	-	-	-	-	-	111	-	-	-	-
NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)[1]	-	-	-	-	-	-	1,125	-	-	-	-
Estimated New York/New Jersey Construction	**0**	**0**	**0**	**0**	**0**	**0**	**1,433**	**0**	**0**	**158**	**0**
Estimated O&M Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,433**	**1,433**	**1,433**	**1,591**
Delaware/Maryland Region											
Skipjack, OCS-A 0519	-	-	-	-	-	-	17	-	-	-	-
US Wind/Maryland Offshore Wind, OCS-A 0490	-	-	-	-	-	125	-	-	-	-	-
GSOE I, OCS-A 0482	-	-	-	-	-	-	96	-	-	-	-
OCS-A 0519 remainder	-	-	-	-	-	-		-	-	-	-

Project/Region	Before 2021	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030 and Beyond
	Number of Foundations										
Estimated Delaware/Maryland Construction	**0**	**0**	**0**	**0**	**0**	**125**	**113**	**0**	**0**	**0**	**0**
Estimated O&M Total	**0**	**0**	**0**	**0**	**0**	**0**	**125**	**238**	**238**	**238**	**238**
South Atlantic Region											
Kitty Hawk North, OCS-A 0508	-	-	-	-	-	-	70	-	-	-	-
Kitty Hawk South, OCS-A 0508	-	-	-	-	-	-	123	-	-	-	-
TotalEnergies Renewables Wind, OCS-A 0545	-	-	-	-	-	-	65	-	-	-	-
Duke Energy Renewables Wind, OCS-A 0546	-	-	-	-	-	-	65	-	-	-	-
Estimated Annual South Atlantic Construction Total	**0**	**0**	**0**	**0**	**0**	**0**	**323**	**0**	**0**	**0**	**0**
Estimated O&M Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**323**	**323**	**323**	**323**
Total											
Estimated Total Construction	**7**	**0**	**0**	**13**	**459**	**406**	**2,348**	**239**	**0**	**158**	**0**
Estimated O&M Total	**7**	**7**	**7**	**7**	**20**	**479**	**885**	**3,233**	**3,472**	**3,472**	**3,630**

[1] BOEM recognizes that the estimates presented within this cumulative analysis are likely high, conservative estimates; however, BOEM believes that this analysis appropriately captures the potential cumulative impacts and errs on the side of maximum impacts.
[2] New England Wind Phase I and Phase 2 would collectively have no more than 130 foundations, and the maximum number of foundations for Phase I would be 64.
[3] Beacon Wind 1 and Beacon Wind 2 would collectively have no more than 157 foundations. BOEM made the assumption to split the foundation numbers evenly across both projects.
CVOW = Coastal Virginia Offshore Wind; GSOE = Garden State Offshore Energy; NE = Northeast

D.2.2 Incorporation by Reference of Cumulative Impacts Study and the Analyses Therein

BOEM has completed a study of Impact-Producing Factors (IPFs) on the North Atlantic OCS to consider in an offshore wind development cumulative impacts scenario (BOEM 2019). The study is incorporated in this document by reference. The study identifies cause-and-effect relationships between renewable energy projects and resources potentially affected by such projects. It further classifies those relationships into a manageable number of IPFs through which renewable energy projects could affect resources, and identifies the types of actions and activities to be considered in a cumulative impacts scenario. These IPFs and their relationships were used in the Final PEIS analysis of cumulative impacts, and BOEM decided which IPF applied to which resource. The study identifies actions and activities that may affect the same physical, biological, economic, or cultural resources as renewable energy projects and states that such actions and activities may have the same IPFs as offshore wind projects.

As discussed in the BOEM (2019) study, reasonably foreseeable activities other than offshore wind projects may also affect the same resources as the six NY Bight projects or other offshore wind projects, possibly via the same IPFs or via IPFs through which offshore wind projects do not contribute. This appendix lists reasonably foreseeable non-offshore-wind activities that may contribute to the cumulative impacts of the NY Bight projects.

D.2.3 Undersea Transmission Lines, Gas Pipelines, and Other Submarine Cables

There are 27 submarine telecommunication cables (18 active and 9 out of service) within the vicinity of the NY Bight lease areas. National Oceanic and Atmospheric Administration (NOAA) nautical charts identify multiple sewer pipelines, stormwater outfalls, and intake structures along the coast of New Jersey and New York that begin onshore and extend offshore.

There are six in-service pipelines within the vicinity of the NY Bight lease areas. The Williams Transco pipeline, which supplies a significant amount of natural gas to New York, is located in the nearshore waters between New Jersey and New York (NYSERDA 2017). A gas pipeline is buried in the northern New York Harbor utility corridor, two gas pipelines and one petroleum product pipeline are buried in the southern New York Harbor utility corridor, and the deeply tunneled replacement Brooklyn-Staten Island water siphon in the New Jersey Harbor.

The New Jersey Board of Public Utilities (NJBPU) and the New York State Public Service Commission (NYSPSC) have proposed transmission systems to which offshore wind lessees could connect. In November 2020, NJBPU asked PJM Interconnection, L.L.C. (PJM) to incorporate New Jersey's offshore wind goals into the Regional Transmission Planning Process, the state agreement approach (SAA) regulatory pathway. Through a competitive procurement, NJBPU awarded a transmission solution to Mid-Atlantic Offshore Development, LLC's and Jersey Central Power & Light Company's jointly submitted Larrabee Tri-Collector Solution to create a single onshore point of interconnection to the PJM high-voltage transmission system at the Larrabee Collector Station. The Larrabee Collector Station will enable interconnection of 3,742 megawatts (MW) of offshore wind generation.[4] As an extension of the SAA and PJM's Regional Transmission Planning Process and separate from its procurement of new offshore wind generation, NJBPU issued a solicitation for construction of the Prebuild Infrastructure (PBI), which is the infrastructure between the identified landing point at Sea Girt National Guard Training Center in New Jersey and the point of interconnection at the Larrabee Collection Station, a distance of approximately 12 miles. PBI will be funded through the Federal Energy Regulatory Commission's (FERC) transmission rates and will be developed, owned, and operated by a transmission system developer.

The New York State Energy Research and Development Authority (NYSERDA) has identified 21 potential onshore points of interconnection for planned offshore wind cables to interconnect to the existing New York State transmission grid (NYSERDA 2017). NYSERDA has more recently advanced efforts for the development and future use of coordinated transmission infrastructure. In June 2023, the New York State Public Service Commission initiated a competitive process[5] for the submission of proposals to build at least 4,700 MW, and up to 8,000 MW of transmission capacity to serve the State's 9,000-MW target (referred to as the New York City Public Policy Transmission Need) in an effort to develop offshore transmission infrastructure capable of collecting energy generated at multiple offshore platforms and delivering it to onshore interconnection points. Awards are anticipated to be issued in 2025.

The offshore wind projects listed in Table D2-1 in Attachment D2 that have a COP under review are presumed to include at least one identified cable route. Proposed cable routes have not yet been announced for the remainder of the projects.

D.2.4 Tidal Energy Projects

BOEM is not aware of any ongoing or planned tidal energy projects in the NY Bight. See the South Fork Wind Farm (OCS-A 0517) and South Fork Export Cable Project Final EIS (BOEM 2021b) for descriptions of other tidal projects that are more distant from the NY Bight projects in Maine and Massachusetts.

D.2.5 Dredging and Port Improvement Projects

The representative ports identified for potential use by the NY Bight projects in New York and New Jersey are: Port of Albany, Port of Coeymans, Brooklyn Navy Yard, South Brooklyn Marine Terminal, Howland Hook/Port Ivory, Arthur Kill Terminal, Paulsboro Marine Terminal, and New Jersey Wind Port. Some dredging projects have also been proposed or studied at ports that may be used by the NY Bight projects in New York and New Jersey, and are either in operation or are considered reasonably foreseeable:

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[4] In March 2023, the State of New Jersey issued an offshore wind solicitation with a requirement for projects to interconnect at the Larrabee site. In January 2024, NJBPU awarded a combined 3,742 MW of offshore wind capacity to Invenergy and energyRE's Leading Light Wind Project and Attentive Energy LLC's Attentive Energy Two Project.

[5] Order Addressing Public Policy Requirements for Transmission Planning Purposes, Case 22-E-0633 (June 22, 2023), https://www.nyiso.com/documents/20142/1406395/PSC-Order-NYC-PPTN.pdf.

- Port Ivory is undeveloped, and all new infrastructure is necessary in order to prepare the site for use as a staging and installation facility. The following improvements are discussed in NYSERDA’s 2018 Ports Assessment: Port Ivory Pre-front End Engineering Design Report (NYSERDA 2019d):
    - Demolish and dispose of existing asphalt and concrete pavement and structures on site.
    - Clear and grub the site of unmaintained vegetation (e.g., trees, bushes).
    - Install marine structures along the waterfront edges of the site, to provide at least two heavy load wharves to load and unload components.
    - Improve the ground-bearing capacity and grade areas within the site.
    - Install surface treatment (i.e., crushed stone) within laydown areas of the site.
    - Dredge the berthing area to provide sufficient depth for design vessels to safely access the site.
- The Port of Albany is to be used as a manufacturing or fabrication facility. The following improvements are discussed in NYSDERA’s 2018 Ports Assessment: Port of Albany-Rensselaer Pre-front End Engineering Design Report (NYSERDA 2019a):
    - Clear and grub the site of unmaintained vegetation (e.g., trees, bushes, etc.).
    - Install marine structures along the waterfront edge of the site, to provide at least two heavy load wharves to load and unload components.
    - Improve the ground-bearing capacity and grade areas within the site.
    - Stabilize the shoreline in order to allow live loads to be applied closer to the crest of the existing shoreline slopes.
    - Install surface treatment (i.e., crushed stone) within laydown areas of the site.
    - Dredge the berthing area to provide sufficient depth for design vessels to safely access the site.
- The Port of Coeymans is currently primarily developed and is anticipating offshore wind projects. The following improvements are discussed in NYSDERA’s 2018 Ports Assessment: Port of Coeymans Pre-front End Engineering Design Report (NYSERDA 2019b):
    - Clear and grub unmaintained areas.
    - Install one heavy load quay along the northeastern shoreline.
    - Grade existing site's waterfront area and upland area, as well as the portion of land in between these zones.
    - Install a retaining wall between the westerly and northerly extents that will tie into the site’s existing slopes to remain.

    - Improve the ground-bearing capacity across the waterfront portion of the site by placing crushed rock above existing grade.
    - Dredge berth area to allow safe vessel access to the site.

- The South Brooklyn Marine Terminal is an operational marine terminal. The following improvements are discussed in NYSDERA's 2018 Ports Assessment: South Brooklyn Marine Terminal Pre-front End Engineering Design Report (NYSERDA 2019c) (groundbreaking occurred in June 2024, and the improvements are currently under construction):
    - Demolish existing buildings and the rail spur on the 39th Street Pier to increase available laydown area and facilitate ground-bearing capacity improvements.
    - Install two heavy load quays, including along the northwest end of the 39th Street Pier and along the southwest end of the 39th Street Pier.
    - Stabilize the 35th Street Pier Revetment to increase the load capacity.
    - Grade existing site.
    - Improve the ground-bearing capacity across the site by placing crushed stone fill above the existing grade.
    - Dredge berth areas to allow safe vessel access to the site.
- The Brooklyn Navy Yard is anticipating major improvements and developments with approximately 5.1 million square feet (.47 million square meters) of vertical manufacturing space, and development of a series of open space and connectivity improvements aimed at integrating the Yard with the surrounding neighborhoods (Brooklyn Navy Yard 2023).
- Arthur Kill Terminal has received $48 million in federal grants to construct Arthur Kill Terminal as an offshore wind staging and assembly coastal seaport on Staten Island (Empire State Development 2022). The New York City Department of Planning released the Final EIS for the project on May 31, 2024.
- General Electric has proposed plans to build a new factory for offshore wind turbine components at its Port of Coeymans site (ESG Review 2023).
- The Paulsboro Marine Terminal is currently receiving improvements, which will aim to support the offshore wind industry as it is being developed as a facility to manufacture and ship monopile foundations for construction of wind turbines off the coast of New Jersey (Jacobs 2022). Some of the improvements are construction of mooring dolphins, dredging, and upland placement of dredged material, and two fabrication buildings in which steel plate welding, roll bending, and circumferential welding will take place (Jacobs 2022).

- The State of New Jersey is planning to build an offshore wind port on the eastern shore of the Delaware River in Lower Alloways Creek, Salem County, approximately 7.5 miles (12 kilometers) southwest of the city of Salem. The New Jersey Economic Development Authority is leading the development of the project on behalf of the state, working alongside key departments and agencies such as the Governor's Office, the Department of the Treasury, and NJBPU. The development plan includes dredging the Delaware River Channel, and construction commenced in September 2021 with a targeted completion date of late 2023 (New Jersey Wind Port 2021; Salem County 2021). The Delaware River Channel dredging project provides deepening of the existing Delaware River Federal Navigation Channel, bend widening, partial deepening of the Marcus Hook anchorage, and relocation and addition of aids to navigation. The deeper channel will allow for more efficient transportation of containerized, dry and liquid bulk, break bulk, roll-on/roll-off, and project cargoes to and from Delaware River ports (USACE 2022b).
- In 2018, two New Jersey Department of Transportation projects, High Bar Harbor channel and Barnegat Light Stake channel, both near Barnegat Inlet in Ocean and Long Beach Townships, New Jersey, underwent dredging of approximately 39,150 cubic yards and 3,230 cubic yards (29,932 cubic meters and 2,470 cubic meters), respectively, to maintain the depths of these channels. Maintenance dredging for both projects is authorized until December 2025 and is expected to occur before the permits expire (USACE 2015a, 2015b). Barnegat Light is the primary commercial seaport on Long Beach Island and is the homeport to approximately 36 commercial vessels. Barnegat Light's two commercial docks are home to several scallop vessels, longliners, and a fleet of smaller inshore gillnetters.
- The U.S. Army Corps of Engineers (USACE) has received numerous permit applications for private dock, boat lift, and bulkhead repairs in Barnegat Bay, New Jersey (USACE 2022a).

D.2.6 Marine Minerals Use and Ocean Dredged Material Disposal

There are no active OCS lease areas for marine minerals within the other uses geographic analysis area (refer to Section 3.6.7, *Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research and Surveys)*) (BOEM 2018). New York has multiple potential sand resource areas, in state and federal waters, along the coast of Long Island for beach renourishment projects. Within federal waters, there are an additional four potential federal sand resource areas. In New York, there are four identified dredge areas (Marine Cadastre 2023).

In New Jersey, the closest previous lease in BOEM's Marine Minerals Program for sand borrow areas for beach replenishment is known as the D2 borrow area, offshore near Harvey Cedars, Surf City, Long Beach Township, Ship Bottom, and Beach Haven (Lease Number OCS-A-050; executed July 1, 2014). The lessee (USACE and the New Jersey Department of Environmental Protection [NJDEP]) was approved through September 20, 2018, for the use of up to 10,000,000 cubic yards (7,645,550 cubic meters) of material to be used for the Long Beach Island Coastal Storm Risk Management Project, Barnegat Inlet to Little Egg Inlet. At present, there are 15 USACE beach renourishment projects in the USACE North Atlantic Division, which includes the New York and Philadelphia Districts, that may target OCS sand

resources (NJDEP pers. comm. 2023). The New York District projects include Sandy Hook to Barnegat Inlet in addition to the Raritan Bay Flood Control Projects of Keansburg, Port Monmouth, Union Beach and Highlands. The Philadelphia District projects include Manasquan Inlet to Barnegat Inlet, Barnegat Inlet to Little Egg Inlet, Brigantine Inlet to Great Egg Inlet (Brigantine), Brigantine Inlet to Great Egg Inlet (Absecon Island), Great Egg Inlet to Pecks Beach, Great Egg Inlet to Townsends Inlet, Townsends Inlet to Cape May Inlet, Hereford Inlet to Cape May Inlet, Cape May Inlet to Lower Township, and Lower Township to Cape May Point. In addition to the OCS sand resource needs for these projects, USACE has additional beach renourishment projects currently targeting sand resources in state waters/inlets.
U.S. Environmental Protection Agency (USEPA) Region 2 is responsible for designating and managing ocean disposal sites for materials offshore in the region of the NY Bight projects. USACE issues permits for ocean disposal sites; all ocean sites are for the disposal of dredged material permitted or authorized under the Marine Protection, Research, and Sanctuaries Act (16 U.S. Code [USC] 1431 et seq. and 33 USC 1401 et seq.).

D.2.7 National Security and Military Use

The Offshore Narragansett Bay Range Complex primarily consists of surface sea space and subsurface space off the coasts of Massachusetts, Rhode Island, and New York. As part of the range complex, the Narragansett Bay Operating Area extends from the shoreline seaward to approximately 180 nm (333 kilometers) from land at its farthest point (Empire 2022). The complex is controlled by the Fleet Area Control and Surveillance Facility at Virginia Capes Naval Air Station Oceana. The Navy installations primarily operating in this complex are in New London, Connecticut, and Newport, Rhode Island.

The Narragansett Bay Warning Area is in the western portion of the Offshore Narragansett Bay Range Complex and is designated for operations where limitations may be imposed on aircraft not participating in operations. The Narragansett Bay Warning Area is actively used for U.S. Navy subsurface and surface training and testing activities and to prepare submarines and their crews for formal voyages. Additionally, this Warning Area is used to support special-use airspace, flight testing, surface-to-air gunnery exercises using conventional ordnance, antisubmarine warfare exercises, and air-intercept training (Empire 2022).

The Atlantic City Complex is located in waters adjacent to the coasts of New Jersey and New York. The range complex is used for training and testing exercises for the U.S. Atlantic Fleet and supports training and testing by other services, primarily the U.S. Air Force. The AEGIS Combat Systems Center, controlled by the Fleet Area Control and Surveillance Facility Virginia Capes, Naval Air Station, Oceana, also conducts operations in the Atlantic City Complex. The United States Coast Guard (USCG) Air Station Atlantic City, located at the Atlantic City International Airport in Egg Harbor, New Jersey, supports a range of USCG operations, including search and rescue, port security, and marine environmental protection services.

Four danger zones/restricted areas—defined as a “water area (or areas) used for target practice, bombing, rocket firing or other especially hazardous operations, normally for the armed forces”—are in the vicinity of the NY Bight lease areas. The danger zones/restricted areas in the area are at the mouth of the New York Harbor, at the Naval Weapons Station Earle in Sandy Hook Bay, in the New York Harbor adjacent to the Stapleton Naval Station, and at the Coast Guard Rifle Range off the coast of Cape May (NOD 2022).

There are two Weapons Training Areas operated by the USCG offshore New York and New Jersey within the geographic analysis area. These training areas are used for proficiency training in law enforcement operations (BOEM 2016) and for small caliber weapons training, generally from small vessels that transit during the day to the training area.

D.2.8 Marine Transportation

Marine transportation in the region is diverse and sourced from many ports and private harbors. Commercial vessel traffic in the region includes research, tug/barge, tankers (such as those used for liquid petroleum), cargo, cruise ships, smaller passenger vessels, and commercial fishing vessels. Recreational vessel traffic includes private motorboats and sailboats. A number of federal agencies, state agencies, educational institutions, and environmental non-governmental organizations participate in ongoing research offshore including oceanographic, biological, geophysical, and archaeological surveys. Most vessel traffic, excluding recreational vessels, tends to travel within established vessel traffic routes, and the number of trips, as well as the number of unique vessels, has remained consistent (USCG 2021). In response to offshore wind projects in the NY Bight, multiple additional fairways and a new anchorage may be established to route existing vessel traffic around wind energy projects (USCG 2021). One new regional maritime highway project received funding from the Maritime Administration. A new barge service (Davisville/Brooklyn/Newark Container-on-Barge Service) is proposed to run twice each week in state waters between Newark, New Jersey, and Brooklyn, New York.

D.2.9 National Marine Fisheries Service Activities

Research and enhancement permits may be issued for marine mammals protected by the Marine Mammal Protection Act (MMPA) and for threatened and endangered species protected under the Endangered Species Act (ESA). NMFS is anticipated to continue issuing research permits under Section 10(a)(1)(A) of the ESA to allow take of certain ESA-listed species for scientific research. Scientific research permits issued by NMFS currently authorize studies on ESA-listed species in the Atlantic Ocean. Current fisheries management and ecosystem monitoring surveys conducted by or in coordination with the Northeast Fisheries Science Center (NEFSC) could overlap with offshore wind lease areas in the New England region and south into the Mid-Atlantic region. Surveys include (1) the NEFSC Bottom Trawl Survey, a more than 50-year multispecies stock assessment tool using a bottom trawl; (2) the NEFSC Sea Scallop/Integrated Habitat Survey, a sea scallop stock assessment and habitat characterization tool, using a bottom dredge and camera tow; (3) the NEFSC Surfclam/Ocean Quahog Survey, a stock assessment tool for both species using a bottom dredge; and (4) the NEFSC Ecosystem Monitoring Program, a more than 40-year shelf ecosystem monitoring program using plankton tows and conductivity, temperature, and depth units. These surveys are anticipated to continue within the region, regardless of offshore wind development.

The regulatory process administered by NMFS, which includes stock assessments for all marine mammals and 5-year reviews for all ESA-listed species, assists in informing decisions on take authorizations and the assessment of project-specific and cumulative impacts that consider ongoing and planned activities in biological opinions. Stock assessments completed regularly under the MMPA include estimates of potential biological removal that stocks of marine mammals can sustainably absorb. MMPA take authorizations require that a proposed action have no more than a negligible impact on species or stocks, and that a proposed action impose the least practicable adverse impact on the species. MMPA authorizations are reinforced by monitoring and reporting requirements so that NMFS is kept informed of deviations from what has been approved. Biological opinions for federal and non-federal actions are similarly grounded in status reviews and conditioned to avoid jeopardy and to allow continued progress toward recovery. These processes help to ensure that, through compliance with these regulatory requirements, a proposed action would not have a measurable impact on the conservation, recovery, and management of the resource.

D.2.9.1 Directed Take Permits for Scientific Research and Enhancement

NMFS issues permits for research on protected species for scientific purposes. These scientific research permits include the authorization of directed take for activities such as capturing animals and taking measurements and biological samples to study their health, tagging animals to study their distribution and migration, photographing and counting animals to get population estimates, taking animals in poor health to an animal hospital, and filming animals. NMFS also issues permits for enhancement purposes; these permits are issued to enhance the survival or recovery of a species or stock in the wild by taking actions that increase an individual's or population's ability to recover in the wild. Scientific research and enhancement permits have been issued previously for satellite, acoustic, and multi-sensor tagging studies on large and small cetaceans; research on reproduction, mortality, health, and conservation issues for North Atlantic right whales (NARWs); and research on population dynamics of harbor and gray seals. Reasonably foreseeable future impacts from scientific research and enhancement permits include physical and behavioral stressors (e.g., restraint and capture, marking, implantable and suction tagging, biological sampling).

D.2.9.2 Fisheries Use and Management

NMFS implements regulations to manage commercial and recreational fisheries in federal waters, including those within the NY Bight lease areas; the State of New Jersey and the State of New York regulate commercial fisheries in their state waters (within 3 nm [5.6 kilometers] of the coastline). The NY Bight overlaps two of NMFS's eight regional councils to manage federal fisheries: the Mid-Atlantic Fishery Management Council (MAFMC), which includes New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina; and the New England Fishery Management Council (NEFMC), which includes Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut (NEFMC 2016). The councils manage species with many Fishery Management Plans (FMPs) that are frequently updated, revised, and amended and coordinate with each other to jointly manage species across jurisdictional boundaries (MAFMC 2019). Many of the fisheries managed by the councils are fished for in state waters or outside of the Mid-Atlantic region, so the council works with the Atlantic States Marine Fisheries

Commission (ASMFC). ASMFC is composed of the 15 Atlantic coast states and coordinates the management of marine and anadromous resources found in the states' marine waters. In addition, the states and NMFS, under the framework of ASMFC's *Amendment 3 to the Interstate Fishery Management Plan for American Lobster*, cooperatively manage the American lobster resource and fishery (NOAA 1997).

The FMPs of the councils and ASMFC were established, in part, to manage fisheries to avoid overfishing. They accomplish this through an array of management measures, including annual catch quotas, minimum size limits, and closed areas. These various measures can further reduce (or increase) the size of landings of commercial fisheries in the Northeast and Mid-Atlantic regions.

NMFS also manages highly migratory species, such as tuna and sharks, that can travel long distances and cross domestic boundaries. Table D-3 summarizes other FMPs and actions in the region.

Table D-3. Other fishery management plans

Area	Plan and Projects
ASMFC	ASMFC *Five-Year Strategic Plan 2019–2023* (ASMFC 2019) ASMFC 2022 Action Plan (ASMFC 2021) *Management, Policy and Science Strategies for Adapting Fisheries Management to Changes in Species Abundance and Distribution Resulting from Climate Change* (ASMFC 2018)
New York	*New York Ocean Action Plan 2017–2027*: adaptive management plan (NYSDEC 2017) New York State filed a petition with NOAA, NMFS, and MAFMC to demand that commercial fluke allocations be revised to provide fishers with equitable access to summer flounder. NMFS announced specifications for the summer flounder, scup, and black sea fisheries. This action is intended to inform the public of the specifications for the 2023 fishing year for summer flounder, scup, and black sea bass. This rule shows the state-by-state allowable commercial fishing quotas (88 *Federal Register* 11 January 3, 2023).
Long Island Regional Development Council	East Hampton Shellfish Hatchery project will consolidate the hatchery's municipal hatchery and nursing facilities. Haskell's seafood facility in East Quogue is proposed to become a fully functioning seafood processing plant.
New Jersey	NJDEP Division of Fish and Wildlife Marine Fisheries Management Rule Amendment Proposal with amendments to rules governing crab and lobster management, commercial Atlantic menhaden fishery, marine fisheries, and fishery management in New Jersey was published in the March 1, 2021, *New Jersey Register* (New Jersey Division of Fish and Wildlife 2021).

D.2.10 Global Climate Change

Climate change results primarily from the increasing concentration of greenhouse gases (GHGs) in the atmosphere, which causes planet-wide physical, chemical, and biological changes, substantially altering the world's oceans and lands. Changes include increases in global atmospheric and oceanic temperature, shifting weather patterns, rising sea levels, and changes in atmospheric and oceanic chemistry (Blunden and Arndt 2020). Section 7.6.1.4 of the Programmatic EIS *for Alternative Energy Development and Production and Alternate Use of Activities on the Outer Continental Shelf* (Minerals Management Service 2007) describes global climate change with respect to assessing renewable energy development. Key drivers of climate change are increasing atmospheric concentrations of carbon dioxide (CO_2) and other GHGs, such as methane (CH_4) and nitrous oxide (N_2O). These GHGs reduce the ability of solar radiation to re-radiate out of Earth's atmosphere and into space. Although all three of these GHGs have natural sources, the majority of these GHGs are released from anthropogenic activity. Since the industrial revolution, the rate at which solar radiation is re-radiated back into space has slowed, resulting in a net increase of energy in the Earth's system (Solomon et al. 2007). This energy increase presents as heat, raising the planet's temperature and causing climate change.

Fluorinated gases are a type of GHG released in trace amounts but are highly efficient at preventing solar radiation from being re-radiated back into space. They have a much longer lifespan than CO_2, CH_4, and N_2O. Fluorinated gases have no natural sources, are either a product or byproduct of manufacturing, and can have 23,000 times the warming potential of an equal amount of CO_2. These gases include hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride. These gases are currently being phased out; however, sulfur hexafluoride is still used in WTG switchgears and OSS high-voltage and medium-voltage gas-insulated switchgears.

The Intergovernmental Panel on Climate Change (IPCC) released a special report in October 2018 that compared risks associated with an increase of global warming of 1.5°C and an increase of 2°C. The report found that climate-related risks depend on the rate, peak, and duration of global warming, and that an increase of 2°C was associated with greater risks associated with climatic changes such as extreme weather and drought; global sea level rise; impacts on terrestrial ecosystems; impacts on marine biodiversity, fisheries, and ecosystems and their functions and services to humans; and impacts on health, livelihoods, food security, water supply, and economic growth (IPCC 2018). High global temperatures increase the amount of sea level rise by the end of the century, with a projected relative sea level rise of 2.0 to 7.2 feet (0.6 to 2.2 meters) along the contiguous United States coastline by 2100 (NOAA 2022). Expected relative sea level rise would cause tide and storm surge heights to increase, leading to a shift in the U.S. coastal flood regimes by 2050 with major and moderate high tide flood events occurring as frequently as moderate and minor high tide flood events occur today (NOAA 2022).

Global emissions of GHGs have impacts whose local effects are increasingly elucidated through research. For example, a recent study concerning the NARW provides evidence that the whale's feeding area moved north following relocation of its food source related to climate change, and whale mortality may have increased because of fewer controls on fishing activities in the new, more northerly area (Meyer-Gutbrod et al. 2021). Climate change is predicted to affect Northeast fishery species in different ways (Hare et al. 2016), and the NMFS biological opinion for *Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf in Massachusetts, Rhode Island, New York and New Jersey Wind Energy Areas* also discusses in detail the potential impacts of global climate change on protected species that occur within the NY Bight area (NMFS 2013).

Local emissions, such as those from maintenance of and accidental chemical leaks from wind energy projects, would contribute incrementally to global GHG emissions. However, the largest climate impact from wind energy projects is expected to be beneficial: the energy generated by wind energy projects is expected to displace energy generated by combustion of fossil fuels, which would lead to reductions in regional emissions of air pollutants and GHGs from fossil-fueled power plants.

Table D-4 summarizes regional plans and policies that are in place to address climate change, and Table D-5 summarizes resiliency plans.

Table D-4. Climate change plans and policies

Plans and Policies	Summary/Goal
New York	
Order Adopting a Clean Energy Standard (State of New York Public Service Commission 2016)	Requirement that 50% of New York's electricity come from renewable energy sources by 2030.
New York State Energy Plan 2015; 2017 Biennial Report to 2015 Plan (NYSERDA 2015, 2017a)	Requires 40% reduction in GHG from 1990 levels, 50% electricity to come from renewable energy resources, and a 600-trillion-British-thermal-unit increase in statewide energy efficiency.
Governor Cuomo State of the State Address 2017, 2018, 2021	2017: Set offshore wind energy development goal of 2,400 MW by 2030 (Governor's Office 2017). 2018: Procurement of at least 800 MW of offshore wind power between two solicitations in 2018 and 2019; new energy efficiency target for investor-owned utilities to more than double utility energy efficiency progress by 2025; energy storage initiative to achieve 1,500 MW of storage by 2025 and up to 3,000 MW by 2030 (Office of the Attorney General 2018; Windpower Engineering & Development 2018). 2021: The governor's 2021 agenda—Reimagine | Rebuild | Renew—establishes a goal of building out the renewable energy program. The agenda notes the development of two new offshore wind farms more than 20 miles offshore of Long Island, as well as the creation of dedicated offshore port facilities and additional transmission capacity development.
Governor Kathy Hochul State of the State Address (2022)	2022: Announced NYSERDA's third offshore wind procurement to be initiated in 2022; the procurement is expected to result in at least 2 gigawatts (GW) of new offshore wind projects. 2022: Announced a $500 million infrastructure investment to develop offshore wind manufacturing and supply chain infrastructure. 2022: Announced a legislative proposal to ensure all new building construction reaches zero emissions by 2027, and to develop 2 million electrified or electrification-ready homes by 2030.
New York State Offshore Wind Master Plan (2017) (NYSERDA 2017) and Master Plan 2.0 (under development)	Grants NYSERDA ability to award 25-year long-term contracts for projects ranging from approximately 200 MW to approximately 800 MW, with an ability to award larger quantities if sufficiently attractive proposals are received. Each proposer is also required to submit at least one proposal of approximately 400 MW. Initial bids were received in early 2019. The State of New York's initial Master Plan included a comprehensive suite of studies and public engagement to determine the most responsible and cost-effective pathways for developing offshore wind energy off of New York State. Master Plan 2.0 will provide a plan for the future of offshore wind development, including in deeper waters off the state's coast.
New York State Clean Water, Clean Air, and Green Jobs Environmental Bond Act (Bond Act)	The Bond Act funding will support new and expanded projects across the State to safeguard drinking water sources, reduce pollution, and protect communities and natural resources from climate change.

Plans and Policies	Summary/Goal
The Climate Leadership and Community Protection Act (CLCPA), enacted on July 18, 2019, signed into law in July 2019, and effective January 1, 2020	The act establishes economy-wide targets to reduce GHG emissions by 40% of 1990 levels by 2030 and 85% of 1990 levels by 2050. Establishes a goal of 9.0 GW of offshore wind generation by 2035. The CLCPA requires that 70 percent of New York State's electricity come from renewable sources by 2030 and 100 percent of electricity come from zero-emission sources by 2040. In addition, the CLCPA requires that New York reduce statewide greenhouse gas emissions to at least 40 percent below 1990 levels by 2030 and at least 85 percent below 1990 levels by 2050.
New Jersey	
Executive Order 28: Measures to Advance New Jersey's Clean Energy Economy (2018)	Sets target of total conversion of the state's energy production profile to 100% clean energy sources on or before January 1, 2050.
New Jersey Energy Master Plan (State of New Jersey 2019, 2020)	Updated in 2019, the plan outlines key strategies to reach the State of New Jersey's goal of 100 percent clean energy by 2050, including accelerating development of offshore wind.
Executive Order 100: Protecting Against Climate Threats (PACT); Land Use Regulations and Permitting (2020)	Establishes a GHG monitoring and reporting program, establishes criteria to govern and reduce emissions, and integrates climate change considerations, such as sea level rise, into regulatory and permitting programs.
Executive Order 307: Increase Offshore Wind Goal to 11,000 Megawatts by 2040 (2022)	Establishes a goal of 11,000 MW of offshore wind energy generation by 2040.

Table D-5. Resiliency plans and policies

Plans and Policies	Summary
New York	
Community Risk and Resiliency Act of 2014	Enacted in 2014, the Act includes five major provisions: 1) Official Sea-level Rise Projections, 2) Consideration of future physical climate risk, 3) Smart Growth Public Infrastructure Policy Act Criteria, 4) Guidance on Natural Resilience Measures, and 5) Model Local Laws Concerning Climate Risk. As of 2019, New York State Department of Environmental Conservation (NYSDEC) is in the process of developing a State Flood Risk Management Guidance document for state agencies (NYSDEC n.d.).
NY Rising Community Reconstruction Program (2018)	$20.4 million in projects on Long Island to help flood-prone communities plan and prepare for extreme weather events as they continue projects to recover from Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. Three projects were announced for Suffolk County and five for Nassau County (Governor's Office 2018).
NYS Smart Growth Program	Community planning and development program with an overall approach of development and conservation strategies that help protect the health and natural environment by making communities more attractive, economically stronger, socially diverse, and resilient to climate change. The Smart Growth policies help communities contribute to both mitigating and adapting to climate change. New York State Department of State administers a portion of the State Smart Growth grant program. More information here: https://dos.ny.gov/nys-smart-growth-program.

Plans and Policies	Summary
New York Water Resources Management	New York encourages community planning at the watershed level. Watershed planning allows communities to integrate water and land resource protection and restoration with growth management at the local and regional level, balancing environmental and economic factors to encourage a healthier, more resilient watershed. New York State provides community assistance in the development and implementation of watershed management plans. More information here: https://dos.ny.gov/water-resources-management.
Local Waterfront Revitalization Program	The Local Waterfront Revitalization Program is New York State's primary program for working in partnership with waterfront communities across New York State. Local Waterfront Revitalization Programs begin with a planning process and are approved at three levels of government (local, state, and federal). Once approved, municipalities are eligible for implementation funds. More information here: https://dos.ny.gov/local-waterfront-revitalization-program.
New York City Watershed Program	The New York City Watershed Program provides technical support for local governments and regional groups in the New York City Watershed. The program provides a regional forum to aid in the long term protection of New York City's drinking water, and the economic vitality of the Upstate Watershed communities. More information here: https://dos.ny.gov/new-york-city-watershed-program.
OneNYC 2050	OneNYC 2050 is a strategy to address challenges facing New York City's future, including addressing climate change. Examples from the strategy include committing to carbon neutrality by 2050 and undertaking comprehensive projects to mitigate climate risk.
NYC Comprehensive Waterfront Plan	Every 10 years, New York City restarts a formal process of thinking collectively about New York City's waterfront and creating a vision for the next decade and beyond. The 2021 Plan, New York City's third Comprehensive Waterfront Plan, puts forth new strategies for an equitable, resilient and healthy waterfront in the face of climate change.
NY and NJ Harbor and Tributaries Focus Area Feasibility Study (HATS)	In response to coastal storms that have had severe impacts on the North Atlantic Coast, USACE is investigating measures to manage future flood risk in ways that support the long-term resilience and sustainability of the coastal ecosystem and surrounding communities, and reduce the economic costs and risks associated with flood and storm events. In support of this goal, USACE completed the North Atlantic Coast Comprehensive Study, which identified nine high-risk, focus areas on the north Atlantic Coast for further in-depth analysis into potential coastal storm risk management measures. One of the nine areas identified was the New York–New Jersey Harbor and Tributaries study area.
New Jersey	
New Jersey Draft Climate Change Resilience Strategy (NJDEP 2021)	This is New Jersey's first statewide climate resiliency strategy and was released as a draft in April 2021. The *Draft Climate Change Resilience Strategy* develops a framework for policy, regulatory, and operational changes to support the resilience of New Jersey's communities, economy, and infrastructure. It includes 125 recommended actions across the following six priority areas: build resilient and healthy communities, strengthen the resilience of New Jersey's ecosystems, promote coordinated governance, invest in information, increase public understanding, promote climate-informed investments and innovative financing, and develop a coastal resilience plan.

D.2.11 Oil and Gas Activities

The NY Bight lease areas are in the North Atlantic Planning Area of the OCS Oil and Gas Leasing Program (National OCS Program). On September 8, 2020, the White House issued a presidential memorandum for the Secretary of the Interior on the withdrawal of certain areas of the United States OCS from leasing disposition for 10 years, including the areas currently designated by BOEM as the South Atlantic and Straits of Florida Planning Areas (The White House 2020a). The South Atlantic Planning Area includes the OCS off South Carolina, Georgia, and northern Florida. On September 25, 2020, the White House issued a similar memorandum for the Mid-Atlantic Planning Area that lies south of the northern administrative boundary of North Carolina (The White House 2020b). This withdrawal prevents consideration of these areas for any leasing for purposes of oil and gas exploration, development, or production during the 10-year period beginning July 1, 2022, and ending June 30, 2032. Existing leases in the withdrawn areas are not affected. On September 29, 2023, the U.S. Department of the Interior announced the availability of the 2024–2029 National Outer Continental Shelf Oil and Gas Leasing Proposed Final Program and corresponding Final Programmatic Environmental Impact Statement. The 2024–2029 Proposed Final Program includes three potential OCS oil and gas lease sales in the Gulf of Mexico. It does not include sales in any other BOEM OCS planning area. On December 14, 2023, the Secretary of the Interior approved the 2024–2029 National Outer Continental Shelf Oil and Gas Leasing Proposed Final Program and signed the corresponding Record of Decision (ROD).

BOEM issues geophysical and geotechnical (G&G) permits to obtain data for hydrocarbon exploration and production; locate and monitor marine mineral resources; aid in locating sites for alternative energy structures and pipelines; identify possible human-made, seafloor, or geological hazards; and locate potential archaeological and benthic resources. G&G surveys are typically classified into categories by equipment type and survey technique. There are currently no such permits under review for areas offshore New York and New Jersey (BOEM 2021c).

Several liquefied natural gas ports are on the East Coast of the United States. Table D-6 lists existing, approved, and proposed liquified natural gas ports on the East Coast that provide (or may provide in the future) services such as natural gas export, natural gas supply to the interstate pipeline system or local distribution companies, storage of liquified natural gas for periods of peak demand, or production of liquified natural gas for fuel and industrial use (FERC 2022a, 2022b).

Table D-6. Liquefied natural gas terminals in the Eastern United States

Terminal Name	Type	Company	Jurisdiction	Distance from NY Bight Lease areas (approximate)	Status
Everett, MA	Import terminal	GDF SUEZ—DOMAC	FERC	90 miles north	Existing
Offshore Boston, MA	Import terminal	Neptune LNG	MARAD/USCG	100 miles north	Existing

Terminal Name	Type	Company	Jurisdiction	Distance from NY Bight Lease areas (approximate)	Status
Offshore Boston, MA	Import terminal, authorized to re-export delivered LNG	Excelerate Energy—Northeast Gateway	MARAD/USCG	95 miles north (Buoy B)	Existing
Cove Point, MD (Chesapeake Bay)	Import terminal / Export terminal	Dominion—Cove Point LNG	FERC	340 miles southwest	Existing
Elba Island, GA (Savannah River)	Import terminal	El Paso—Southern LNG	FERC	835 miles southwest	Existing
Elba Island, GA (Savannah River)	Import terminal / Export terminal	Southern LNG Company	FERC	835 miles southwest	Existing
Jacksonville, FL	Export terminal	Eagle LNG Partners	FERC	960 miles southwest	Proposed

Source: FERC 2022a; 2022b.
DOMAC = Distrigas of Massachusetts LLC; GDF = Gaz de France; FL = Florida; GA = Georgia; LNG = liquified natural gas; MA = Massachusetts; MARAD = U.S. Department of Transportation Maritime Administration; MD = Maryland

D.2.12 Onshore Development Activities

Onshore development activities that may contribute to cumulative impacts include visible infrastructure such as onshore wind turbines, buildings (such as offices, retail, and multi-use spaces) and cell towers, port development, transportation projects, onshore coastal developments near landfall locations, and other energy projects such as transmission and pipeline projects. Coastal development projects permitted through regional planning commissions, counties, and towns may also contribute to cumulative impacts. These may include residential, commercial, and industrial developments spurred by population growth in the region (Table D-7).

Table D-7. Existing, approved, and planned onshore development activities

Type	Description
Local planning documents	Atlantic County Planning Board Master Plan (Atlantic County 2018) Camden County Comprehensive Plan (Camden County 2014) Cape May County Comprehensive Plan (Cape May County 2022) City of Atlantic City Master Plan (City of Atlantic City 2016) City of New York 2021–2025 Consolidated Plan (NYC Planning 2021) City of Ocean City Master Plan Reexamination Report (City of Ocean City 2019) City of Rensselaer Comprehensive Plan (City of Rensselaer 2006) City of Sea Isle City 2017 Master Plan Reexamination Report (City of Sea Isle City 2017) Creating Resilience: A Planning Initiative, City of Long Beach Comprehensive Plan (City of Long Beach 2018) Gloucester County Community Vision for Gloucester County (Gloucester County 2015) Hudson County Master Plan Re-Examination Report (Hudson County 2016) King County Comprehensive Plan (King County 2016) Monmouth County Planning Board Master Plan (Monmouth County 2016) Nassau County Master Plan (Nassau County Planning Department 2010) Ocean County Master Plan Amendments (Ocean County 2016, Ocean County 2018) Ocean County Planning Board Comprehensive Master Plan (Ocean County 2011)

Type	Description
	Staten Island Comprehensive Economic Development Strategy 2020 (Staten Island Economic Development Corporation 2020) Salem County Growth Management Element of the Comprehensive County Master Plan (Salem County 2015) Suffolk County Comprehensive Master Plan 2035 (Suffolk County 2015) The City of Albany Comprehensive Plan 2030 (City of Albany 2012) Town of Brunswick Draft Comprehensive Plan (Town of Brunswick 2013) Township of Burlington Comprehensive Plan (Township of Burlington 2008) Township of Egg Harbor Community Development Plan for Business Districts / Economic Development Element (Egg Harbor Township 2017) Township of Union Master Plan (Township of Union 2021)
Onshore wind projects	According to the U.S. Geological Survey, there are three onshore wind projects within 40 miles of the NY Bight lease areas. The Bayonne Wind Energy Project consists of one 1.5 MW turbine with a tip height 103.60 meters and rotor diameter of 77 meters; Jersey Atlantic Wind Farm consists of five 1.5 MW turbines with a tip height of 118.6 meters and rotor diameter of 77.0 meters (Hoen et al. 2021). Additionally, there is one unnamed onshore wind project in Sunset Park, Brooklyn that consists of one turbine. The specifications of that turbine are unknown.
Development projects	As part of New York State's $100 billion infrastructure project, $5.6 billion will go to transform the Long Island Railroad to improve system connectivity. Within Suffolk County, the following stations will receive funds for upgrades: Brentwood, Deer Park, East Hampton, Northport, Ronkonkoma, Stony Brook, Port Jefferson, and Wyandanch. The East Hampton historic Long Island Railroad Station will undergo upgrades and modernizations (Metropolitan Transit Authority 2017; Press Release Point 2017). Additional plans for transit-oriented design and highway improvements are planned in Suffolk County in state and county planning documents. The Fire Island Inlet to Montauk Point Project is a $1.2 billion project by USACE, NYSDEC, and Long Island, New York, municipalities to engage in inlet management; beach, dune, and berm construction; breach response plans; raising and retrofitting 4,400 homes; road-raising; groin modifications; and coastal process features. Within Suffolk County, portions of the Towns of Babylon, Islip, Brookhaven, Southampton, and East Hampton; 12 incorporated villages along Long Island's south shore (mainland); Fire Island National Seashore; and the Poospatuck and Shinnecock Indian Reservations will be involved in this project (USACE 2018). A $2.7 million development project has been proposed for the former site of Bader Field, Atlantic City, adjacent to the Atlantic City estuary. The 143-acre Bader Field, now vacant, was the site of the first airport in the United States. The proposed development would include a 2.44-mile (4-kilometer) auto course, about 2,000 units of housing in various price ranges, a retail promenade, and other auto-themed attractions (Associated Press 2022). As part of a comprehensive flood-control strategy, Ocean City, New Jersey, is spending $25 million through 2025 to build new pumping stations, drainage systems, berms and retention walls, and new elevated road construction to control flooding in low-lying areas (City of Ocean City 2021a, 2021b). Additionally, there are several planned federal and state hurricane and storm damage reduction, beach nourishment, coastal storm risk management, flood and coastal storm damage reduction, and ecosystem restoration projects planned along coastal New Jersey (NJDEP 2022).
Port studies/ upgrades	The State of New Jersey is planning to build an offshore wind port on the eastern shore of the Delaware River in Lower Alloways Creek, Salem County, approximately 7.5 miles southwest of the city of Salem. The port site is adjacent to Public Service Electric & Gas's (PSE&G's) Hope Creek Nuclear Generating Station. The New Jersey Economic Development

Type	Description
	Authority (NJEDA) is leading the development of the project on behalf of the state, working alongside key departments and agencies such as the Governor’s Office, the Department of the Treasury, and NJBPU. Construction commenced in 2021 with a targeted completion date of late 2023. The development plan includes construction of a heavy-lift wharf with a dedicated delivery berth and an installation berth that can accommodate jack-up vessels, a 30-acre marshalling area for component assembly and staging, a dedicated overland heavy-haul transportation corridor, and potential for additional laydown areas. NJEDA estimates the project will cost $300 to $400 million (New Jersey Wind Port 2021). Both the Atlantic Shores South (OCS-A 0499) and Ocean Wind 2 (OCS-A 0532) projects have committed to building a nacelle assembly facility at the New Jersey Wind Port. The nacelle houses the components that convert the mechanical energy of the rotating blades into electrical energy and is the highest value-added offshore wind component. Atlantic Shores plans to partner with MHI Vestas for this facility while Ocean Wind will collaborate with General Electric (NJBPU 2021). In 2020, the State of New Jersey announced a $250 million investment in a manufacturing facility to build steel components for offshore wind turbines at the Port of Paulsboro on the Delaware River in New Jersey (New Jersey State 2020). Construction on the facility began in January 2021, with production anticipated to begin in 2023 (New Jersey Business 2020). Both the Atlantic Shores South and Ocean Wind 2 projects will utilize the foundation manufacturing facility at the Port of Paulsboro (NJBPU 2021). Ports in New York may require upgrades to support the offshore wind industry developing in the northeastern United States. Upgrades may include onshore developments or underwater improvements (such as dredging). In December 2017, NYSERDA issued an offshore wind master plan that assessed 54 distinct waterfront sites along the New York Harbor and Hudson River and 11 distinct areas with multiple small sites along the Long Island coast. Twelve waterfront areas and five distinct areas were singled out for “potential to be used or developed into facilities capable of supporting OSW projects” (Table 26, NYSERDA 2017). Nearly all identified sites would require some level of infrastructure upgrade (from minimal to significant) depending on offshore wind activities intended for the site. Particular sites of interest include Red Hook-Brooklyn, South Brooklyn Marine Terminal, and the Port of Coeymans (NYSERDA 2017). For additional information regarding specific proposed improvements to these ports, see Capital Region Economic Development Council 2018, American Association of Port Authorities 2016, Rulison 2018, and NYCEDC 2018. New York State has proposed port improvements that include the governor’s 2021 agenda “Reimagine | Rebuild | Renew,” which includes upgrades to create five dedicated port facilities for offshore wind, including the following: • The nation’s first offshore wind tower manufacturing facility, to be built at the Port of Albany • An offshore wind turbine staging facility and O&M hub to be established at the South Brooklyn Marine Terminal • Increasing the use of the Port of Coeymans for cutting-edge turbine foundation manufacturing • Buttressing ongoing O&M out of Port Jefferson and Port of Montauk Harbor in Long Island

Attachment D1: Ongoing and Planned Non-Offshore-Wind Activity Analysis

BOEM developed the following tables based on its 2019 study *National Environmental Policy Act Documentation for Impact-Producing Factors in the Offshore Wind Cumulative Impacts Scenario on the North Atlantic Outer Continental Shelf* (BOEM 2019), which evaluates potential impacts associated with ongoing and planned non-offshore-wind activities.

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Table D1-1. Summary of non-offshore-wind activities and the associated impact-producing factors for air quality

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/ fluids/hazmat	Accidental releases of air toxics or hazardous air pollutants (HAPs) are due to potential chemical spills. Ongoing releases would occur in low frequencies. These may lead to short-term periods of toxic pollutant emissions through surface evaporation. According to the U.S. Department of Energy, 31,000 barrels of petroleum are spilled into U.S. waters from vessels and pipelines in a typical year. Approximately 40.5 million barrels of oil were lost as a result of tanker incidents from 1970 to 2009, according to International Tanker Owners Pollution Federation Limited, which collects data on oil spills from tankers and other sources. From 1990 to 1999, the average annual input to the coastal Northeast was 220,000 barrels of petroleum and offshore it was up to less than 70,000 barrels.	Accidental releases of air toxics or HAPs would be due to potential chemical spills. See Table D1-23 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. These may lead to short-term periods of toxic pollutant emissions through evaporation. Air quality impacts would be short term and limited to the local area at and around the accidental release location.
Air emissions: Construction and decommissioning	Air emissions originate from combustion engines and electric power generated by burning fuel. These activities are regulated under the Clean Air Act (CAA) to meet set standards. Air quality has generally improved over the last 35 years; however, some areas in the Northeast have experienced a decline in air quality over the last 2 years. Some areas of the Atlantic coast remain in nonattainment for ozone, with the source of this pollution from power generation. Many of these states have made commitments toward cleaner energy goals to improve this, and offshore wind is part of these goals. Primary processes and activities that can affect the air quality impacts are expansions and modifications to existing fossil fuel power plants, onshore and offshore activities involving renewable energy facilities, and various construction activities. The construction, operation, and decommissioning of offshore wind projects would produce GHG emissions (nearly all CO_2) that can contribute to climate change; however, these contributions would be minuscule compared to aggregate global emissions. CO_2 is relatively stable in the atmosphere and generally mixed uniformly throughout the troposphere and stratosphere; therefore, the impact of GHG emissions does not depend upon the source location. Increasing energy production from offshore wind projects will likely decrease GHGs emissions by replacing energy from fossil fuels.	The largest air quality impacts over the next 35 years would occur during the construction phase of any one project; however, projects will be required to comply with the CAA. During the limited construction and decommissioning phases, emissions may occur that are above *de minimis* thresholds and will require offsets and mitigation. Primary emission sources would be increased commercial vehicular traffic, air traffic, public vehicular traffic, and combustion emissions from construction equipment and fugitive emissions from construction-generated dust. As projects come online, power generation emissions overall would decline, and the industry as a whole would have a net benefit on air quality.
Air emissions: O&M		Activities associated with O&M of onshore wind projects would have a proportionally very small contribution to emissions compared to the construction and installation and decommissioning activities over the next 35 years. Emissions would largely be due to commercial vehicular traffic and operation of emergency diesel generators. Such activity would result in short-term, intermittent, and widely dispersed emissions and small air quality impacts.
Air emissions: Power generation emissions reductions		Many Atlantic states have committed to clean energy goals, with offshore wind being a large part of that. Other reductions include transitioning to onshore wind and solar. The No Action Alternative without implementation of other planned onshore wind projects would likely result in increased air quality impacts regionally due to the need to construct and operate new energy generation facilities to meet future power demands. These facilities may consist of new natural-gas-fired power plants, coal-fired, oil-fired, or clean-coal-fired plants. These types of facilities would likely have larger and continuous emissions and result in greater regional scale impacts on air quality.
Air emissions: GHGs		Development of planned onshore wind projects would produce a small overall increase in GHG emissions over the next 35 years. However, these contributions would be very small compared to the aggregate global emissions. The impact on climate change from these activities would be very small. As more projects come online, there would be some reduction in GHG emissions from modifications of existing fossil fuel facilities to reduce power generation. Overall, it is anticipated that there would be no cumulative impact on global warming as a result of onshore wind project activities.
Accidental releases: Fuel/ fluids/hazmat	Accidental releases of air toxics or hazardous air pollutants (HAPs) are due to potential chemical spills. Ongoing releases would occur in low frequencies. These may lead to short-term periods of toxic pollutant emissions through surface evaporation. According to the U.S. Department of Energy, 31,000 barrels of petroleum are spilled into U.S. waters from vessels and pipelines in a typical year. Approximately 40.5 million barrels of oil were lost as a result of tanker incidents from 1970 to 2009, according to International Tanker Owners Pollution Federation Limited, which collects data on oil spills from tankers and other sources. From 1990 to 1999, the average annual input to the coastal Northeast was 220,000 barrels of petroleum and offshore it was up to less than 70,000 barrels.	Accidental releases of air toxics or HAPs would be due to potential chemical spills. See Table D1-23 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. These may lead to short-term periods of toxic pollutant emissions through evaporation. Air quality impacts would be short term and limited to the local area at and around the accidental release location.

hazmat = hazardous materials

Table D1-2. Summary of non-offshore-wind activities and the associated impact-producing factors for bats

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded and would result in high-intensity, low-exposure-level, long-term, but localized intermittent risk to bats in nearshore waters. Direct impacts are not expected to occur, as recent research has shown that bats may be less sensitive to temporary threshold shifts (TTS) than other terrestrial mammals (Simmons et al. 2016). Indirect impacts (i.e., displacement from potentially suitable habitats) could occur because of construction activities, which could generate noise sufficient to cause avoidance behavior (Schaub et al. 2008). Construction activity would be temporary and highly localized.	Similar to Ongoing Activities, noise associated with pile-driving activities would be limited to nearshore waters and these high-intensity, but low-exposure, risks would not be expected to result in direct impacts. Some indirect impacts (i.e., displacement from potentially suitable foraging habitats) could occur as a result of construction activities, which could generate noise sufficient to cause avoidance behavior (Schaub et al. 2008). Construction activity would be temporary and highly localized, and no population-level effects would be expected.
Noise: Construction	Onshore construction occurs regularly for generic infrastructure projects in the bats geographic analysis area. There is a potential for displacement caused by equipment if construction occurs at night (Schaub et al. 2008). Any displacement would only be temporary. No individual or population-level impacts would be expected. Some bats roosting in the vicinity of construction activities may be disturbed during construction but would be expected to move to a different roost farther from construction noise. This would not be expected to result in any impacts, as frequent roost switching is a common component of a bat's life history (Hann et al. 2017; Whitaker 1998).	Onshore construction is expected to continue at current trends. Some behavioral responses and avoidance of construction areas may occur (Schaub et al. 2008). However, no injury or mortality would be expected.
Presence of structures: Migration disturbances	There may be a few structures scattered throughout the offshore bats geographic analysis area, such as navigation and weather buoys and light towers. Migrating bats can easily fly around or over these sparsely distributed structures, and no migration disturbance would be expected. Bat use of offshore areas is very limited and generally restricted to spring and fall migration. Very few bats would be expected to encounter structures on the OCS and no population-level effects would be expected.	The infrequent installation of future new structures in the marine environment of the next 35 years is expected to continue. As described under Ongoing Activities, these structures would not be expected to cause disturbance to migrating tree bats in the marine environment.
Presence of structures: Turbine strikes	There may be a few structures in the offshore bats geographic analysis area, such as navigation and weather buoys, turbines, and light towers. Migrating tree bats can easily fly around or over these sparsely distributed structures, and no strikes would be expected.	The infrequent installation of future new structures in the marine environment of the next 35 years is expected to continue. As described under Ongoing Activities, these structures would not be expected to result in increased collision risk to migrating tree bats in the marine environment.
Land disturbance: Onshore construction	Onshore construction activities are expected to continue at current trends. Potential direct effects on individuals may occur if construction activities include tree removal when bats are potentially present. Injury or mortality may occur if trees being removed are occupied by bats at the time of removal. While there is some potential for indirect impacts associated with habitat loss, no individual or population-level effects would be expected.	Planned non-offshore-wind development would continue to occur at the current rate. This development has the potential to result in habitat loss and could result in injury or mortality of individuals.

Table D1-3. Summary of non-offshore-wind activities and the associated impact-producing factors for benthic resources

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/ fluids/hazmat	See Table D1-23 for a discussion of ongoing accidental releases. Accidental releases of hazmat occur periodically, mostly consisting of fuels, lubricating oils, and other petroleum compounds. Because most of these materials tend to float in seawater, they rarely contact benthic resources. The chemicals with potential to sink or dissolve rapidly often dilute to non-toxic levels before they affect benthic resources. The corresponding impacts on benthic resources are rarely noticeable.	Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. See the previous cell and Table D1-23 on water quality for details.
Accidental releases: Invasive species	Invasive species are periodically released accidentally during ongoing activities, including the discharge of ballast water and bilge water from marine vessels. The impacts on benthic resources (e.g., competitive disadvantage, smothering) depend on many factors, but can be noticeable, widespread, and permanent.	No future activities were identified within the geographic analysis area other than ongoing activities.
Accidental releases: Trash and debris	Ongoing releases of trash and debris occur from onshore sources, fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities and cables, and lines and pipeline laying. However, there does not appear to be evidence that ongoing releases have detectable impacts on benthic resources.	No future activities were identified within the geographic analysis area other than ongoing activities.
Anchoring	Regular vessel anchoring related to ongoing military, survey, commercial, and recreational activities continue to cause temporary to permanent impacts in the immediate area where anchors and chains meet the seafloor. These impacts include increased turbidity levels and the potential for direct contact to cause injury and mortality of benthic resources, as well as physical damage to their habitats. All impacts are localized, turbidity is temporary, injury and mortality are recovered in the short term, and physical damage can be permanent if it occurs in eelgrass beds or hard bottom.	No future activities were identified within the geographic analysis area other than ongoing activities.
Cable emplacement and maintenance	Cable maintenance activities infrequently disturb benthic resources and cause temporary increases in suspended sediment; these disturbances would be localized and limited to the emplacement corridor. New cables are infrequently added near shore. Cable emplacement/maintenance activities injure and kill benthic resources and result in temporary to long-term habitat alterations. The intensity of impacts depends on the time (season) and place (habitat type) where the activities occur. (See also the Sub-IPFs of Seabed profile alterations and Sediment deposition and burial.)	No future activities were identified within the geographic analysis area other than ongoing activities.
Cable emplacement and maintenance: Seabed profile alterations	Ongoing sediment dredging for navigation purposes results in localized, short-term impacts (habitat alteration, injury, and mortality) on benthic resources through this IPF. Dredging typically occurs only in sandy or silty habitats, which are abundant in the geographic analysis area and are quick to recover from disturbance. Therefore, such impacts, while locally intense, have little impact on benthic resources in the geographic analysis area.	No future activities were identified within the geographic analysis area other than ongoing activities.
Cable emplacement and maintenance: Sediment deposition and burial	Ongoing sediment dredging for navigation purposes results in fine sediment deposition. Ongoing cable maintenance activities also infrequently disturb bottom sediments; these disturbances are localized and limited to the emplacement corridor. Sediment deposition could have adverse impacts on some benthic resources, especially eggs and larvae, including smothering and loss of fitness. Impacts may vary based on season/time of year. Where dredged materials are disposed of, benthic resources are smothered. However, such areas are typically recolonized naturally in the short term. Most sediment dredging projects have time-of-year restrictions to minimize impacts on benthic resources. Most benthic resources in the geographic analysis area are adapted to the turbidity and periodic sediment deposition that occur naturally in the geographic analysis area.	USACE or private ports may undertake dredging projects periodically. Where dredged materials are disposed, benthic resources are buried. However, such areas are typically recolonized naturally in the short term. Most benthic resources in the geographic analysis area are adapted to the turbidity and periodic sediment deposition that occur naturally in the geographic analysis area.
Discharges/intakes	The gradually increasing amount of vessel traffic is increasing the cumulative permitted discharges from vessels. Many discharges are required to comply with permitting standards established to ensure potential impacts on the environment are minimized or mitigated. However, there does not appear to be evidence that the volumes and extents have any impact on benthic resources.	There is the potential for new ocean dumping/dredge disposal sites in the Northeast. Impacts (disturbance, reduction in fitness) of infrequent ocean disposal on benthic resources are short term because spoils are typically recolonized naturally. In addition, USEPA has established dredge spoil criteria and it regulates the disposal permits issued by USACE; these discharges are required to comply with permitting standards established to ensure potential impacts on the environment are minimized or mitigated.
Electric and magnetic fields and cable heat	Electromagnetic fields (EMFs) continuously emanate from existing telecommunication and electrical power transmission cables. New cables generating EMFs are infrequently installed in the geographic analysis area. Some benthic species can detect EMFs, although EMFs do not appear to present a barrier to movement. The extent of impacts (behavioral changes) is likely less than 50 feet (15.2 meters) from the cable and the intensity of impacts on benthic resources is likely undetectable.	No future activities were identified within the geographic analysis area other than ongoing activities.
Noise: Onshore/offshore construction	See Table D1-10 on finfish, invertebrates, and essential fish habitat (EFH). Detectable impacts of construction noise on benthic resources rarely, if ever, overlap from multiple sources.	See Table D1-10 on finfish, invertebrates, and EFH. Detectable impacts of construction noise on benthic resources would rarely, if ever, overlap from multiple sources.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Noise: G&G	See Table D1-10 on finfish, invertebrates, and EFH. Detectable impacts of G&G noise on benthic resources rarely, if ever, overlap from multiple sources.	See Table D1-10 on finfish, invertebrates, and EFH. Detectable impacts of G&G noise on benthic resources would rarely, if ever, overlap from multiple sources.
Noise: O&M	See Table D1-10 on finfish, invertebrates, and EFH.	See Table D1-10 on finfish, invertebrates, and EFH.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water or through the seabed can cause injury or mortality of benthic resources in a small area around each pile and can cause short-term stress and behavioral changes to individuals over a greater area. The extent depends on pile size, hammer energy, and local acoustic conditions.	No future activities were identified within the geographic analysis area other than ongoing activities.
Noise: Cable laying/ trenching	Infrequent trenching activities for pipeline and cable laying, as well as other cable burial methods, emit noise. These disturbances are localized and temporary, and they extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	New or expanded submarine cables and pipelines are likely to occur in the geographic analysis area. These disturbances would be infrequent over the next 35 years, they would be localized and temporary, and they would extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.
Port utilization: Expansion	See Table D1-10 on finfish, invertebrates, and EFH.	See Table D1-10 on finfish, invertebrates, and EFH.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear are periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. The lost gear, moved by currents, can disturb, injure, or kill benthic resources, creating small, short-term, localized impacts.	Future new cables would present additional risk of gear loss, resulting in small, short-term, localized impacts (disturbance, injury).
Presence of structures: Hydrodynamic disturbance	See Table D1-10 on finfish, invertebrates, and EFH.	See Table D1-10 on finfish, invertebrates, and EFH.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, continuously create uncommon relief in a mostly sandy seascape. Structure-oriented fishes are attracted to these locations. Increased predation upon benthic resources by structure-oriented fishes can adversely affect populations and communities of benthic resources. These impacts are localized and permanent.	New cables installed in the geographic analysis area over the next 35 years would likely require hard protection atop portions of the route (see the "Cable emplacement and maintenance" IPF). Any new towers, buoys, or piers would also create uncommon relief in a mostly flat, sandy seascape. Structure-oriented fishes could be attracted to these locations. Increased predation upon benthic resources by structure-oriented fishes could adversely affect populations and communities of benthic resources. These impacts are expected to be localized and to be permanent as long as the structures remain.
Presence of structures: Habitat conversion	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, continuously provide uncommon hard-bottom habitat. A large portion is homogeneous sandy seascape but there is some other hard or complex habitat. Benthic species dependent on hard-bottom habitat can benefit on a constant basis, although the new habitat can also be colonized by invasive species (e.g., certain tunicate species). Structures are periodically added, resulting in the conversion of existing soft-bottom and hard-bottom habitat to the new hard-structure habitat.	See above for quantification and timing. Any new towers, buoys, piers, or cable protection structures would create uncommon relief in a mostly sandy seascape. Benthic species dependent on hard-bottom habitat could benefit, although the new habitat could also be colonized by invasive species (e.g., certain tunicate species). Soft bottom is the dominant habitat type in the region, and species that rely on this habitat would not likely experience population-level impacts (Guida et al. 2017; Greene et al. 2010).
Presence of structures: Cable infrastructure	The presence of cable infrastructure, especially hard protection atop cables, causes impacts through entanglement/ gear loss/damage, fish aggregation, and habitat conversion.	See other sub-IPFs within Presence of structures.

hazmat = hazardous materials

Table D1-4. Summary of non-offshore-wind activities and the associated impact-producing factors for birds

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/fluids/hazmat	See Table D1-23 for a quantitative analysis of these risks. Ongoing releases are frequent/chronic. Ingestion of hydrocarbons can lead to morbidity and mortality due to decreased hematological function, dehydration, drowning, hypothermia, starvation, and weight loss (Briggs et al. 1997; Haney et al. 2017; Paruk et al. 2016). Additionally, even small exposures that cause feather oiling can lead to sublethal effects that include changes in flight efficiencies and result in increased energy expenditure during daily and seasonal activities including chick provisioning, commuting, courtship, foraging, long-distance migration, predator evasion, and territory defense (Maggini et al. 2017). These impacts rarely result in population-level impacts.	See Table D1-23 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the potential risk of accidental releases and associated impacts, including mortality, decreased fitness, and health effects on individuals. Impacts are unlikely to affect populations.
Accidental releases: Trash and debris	Trash and debris are accidentally discharged through onshore sources; fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation, navigation, and traffic; survey activities; and cables, lines, and pipeline laying on an ongoing basis. In a study from 2010, students at sea collected more than 520,000 bits of plastic debris per square mile. In addition, many fragments come from consumer products blown out of landfills or tossed out as litter (Law et al. 2010). Birds may accidentally ingest trash mistaken for prey. Mortality is typically a result of blockages caused by both hard and soft plastic debris (Roman et al. 2019).	As population and vessel traffic increase gradually over the next 35 years, accidental release of trash and debris may increase. This may result in increased injury or mortality of individuals. However, there does not appear to be evidence that the volumes and extents would have any impact on bird populations.
Cable emplacement and maintenance	Cable emplacement and maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances will be temporary and generally limited to the emplacement corridor. Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances will be temporary and limited to the emplacement corridor. Suspended sediment could impair the vision of diving birds that are foraging in the water column (Cook and Burton 2010). However, given the localized nature of the potential impacts, individuals would be expected to successfully forage in nearby areas not affected by increased sedimentation and no biologically significant impacts on individuals or populations would be expected.	Future new cables would occasionally disturb the seafloor and cause temporary increases in suspended sediment, resulting in localized, short-term impacts, with no biologically significant impacts on individuals or populations.
Lighting: Vessels	Ocean vessels have an array of lights including navigational lights, deck lights, and interior lights. Such lights can attract some birds. The impact is localized and temporary. This attraction would not be expected to result in an increased risk of collision with vessels. Population-level impacts would not be expected.	Gradually increasing vessel traffic over the next 35 years would increase the potential for bird and vessel interactions. While birds may be attracted to vessel lights, this attraction would not be expected to result in increased risk of collision with vessels. No population-level impacts would be expected.
Lighting: Structures	Buoys, towers, and onshore structures with lights can attract birds. Onshore structures like houses and ports emit a great deal more light than offshore buoys and towers. This attraction has the potential to result in an increased risk of collision with lighted structures (Hüppop et al. 2006). Light from structures is widespread and permanent near the coast, but minimal offshore.	Light from onshore structures is expected to gradually increase in proportion with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Cable emplacement and maintenance	Cable emplacement and maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances will be temporary and generally limited to the emplacement corridor. Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances will be temporary and limited to the emplacement corridor. Suspended sediment could impair the vision of diving birds that are foraging in the water column (Cook and Burton 2010). However, given the localized nature of the potential impacts, individuals would be expected to successfully forage in nearby areas not affected by increased sedimentation and no biologically significant impacts on individuals or populations would be expected.	Future new cables would occasionally disturb the seafloor and cause temporary increases in suspended sediment, resulting in localized, short-term impacts, with no biologically significant impacts on individuals or populations.
Land disturbance: Onshore construction	Onshore construction activity will continue at current trends. There is some potential for indirect impacts associated with habitat loss and fragmentation.	Future non-offshore-wind development would continue to occur at the current rate. This development has the potential to result in habitat loss but would not be expected to result in injury or mortality of individuals.
Noise: Aircraft	Aircraft routinely travel in the geographic analysis area for birds. With the possible exception of rescue operations and survey aircraft, no ongoing aircraft flights would occur at altitudes that would elicit a response from birds. If flights are at a sufficiently low altitude, birds may flush, resulting in non-biologically significant increased energy expenditure. Disturbance, if any, would be localized and temporary and impacts would be expected to dissipate once the aircraft has left the area.	Aircraft noise is likely to continue to increase as commercial air traffic increases; however, very few flights would be expected to be at a sufficiently low altitude to elicit a response from birds. If flights are at a sufficiently low altitude, birds may flush, resulting in non-biologically significant increased energy expenditure. Disturbance, if any, would be localized and temporary and impacts would be expected to dissipate once the aircraft has left the area.
Noise: G&G	Infrequent site characterization surveys and scientific surveys produce high-intensity impulsive noise around sites of investigation. These activities could result in diving birds leaving the local area. Non-diving birds would be unaffected. Any displacement would only be temporary during non-migratory periods, but impacts could be greater if displacement were to occur in preferred feeding areas during seasonal migration periods.	Same as ongoing activities, with the addition of possible future oil and gas surveys.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water could result in intermittent, temporary, localized impacts on diving birds due to displacement from foraging areas if birds are present in the vicinity of pile-driving activity. The extent of these impacts depends on pile size, hammer energy, and local acoustic conditions. No biologically significant impacts on individuals or populations would be expected.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.
Noise: Onshore construction	Onshore construction is routinely used in generic infrastructure projects. Equipment could potentially cause displacement. Any displacement would only be temporary, and no individual fitness or population-level impacts would be expected.	Onshore construction will continue at current trends. Some behavioral responses could range from escape behavior to mild annoyance, but no individual injury or mortality would be expected.
Noise: Vessels	Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Sub-surface noise from vessels could disturb diving birds foraging for prey below the surface. The consequence to birds would be similar to that of noise from G&G but likely less because noise levels are lower.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.
Presence of structures: Entanglement, gear loss, gear damage	Each year, 2,551 seabirds die annually from interactions with U.S. commercial fisheries on the Atlantic (Sigourney et al. 2019). Even more die due to abandoned commercial fishing gear (nets). In addition, recreational fishing gear (hooks and lines) is periodically lost on existing buoys, pilings, hard protection, and other structures and has the potential to entangle birds.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various hard protections atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented fishes are attracted to these objects. These impacts are localized and can be short term to permanent. Fish aggregation can provide localized, short-term to permanent, beneficial impacts on some bird species because it could increase prey species availability.	New cables, installed incrementally in the geographic analysis area for birds over the next 20 to 35 years, would likely require hard protection atop portions of the cables (see the “Cable emplacement and maintenance” IPF). Any new towers, buoys, or piers would also create uncommon relief in a mostly flat seascape. Structure-oriented fishes could be attracted to these locations. Abundance of certain fishes may increase. These fish aggregations can provide localized, short-term to permanent beneficial impacts on some bird species due to increased prey species availability.
Presence of structures: Migration disturbances	A few structures may be scattered about the offshore geographic analysis area for birds, such as navigation and weather buoys and light towers. Migrating birds can easily fly around or over these sparsely distributed structures.	The infrequent installation of future new structures in the marine or onshore environment over the next 35 years would not be expected to result in migration disturbances.
Presence of structures: Turbine strikes, displacement, and attraction	A few structures may be in the offshore geographic analysis area for birds, such as navigation and weather buoys, turbines, and light towers. Given the limited number of structures currently in the geographic analysis area, individual- and population-level impacts due to displacement from current foraging habitat would not be expected. Stationary structures in the offshore environment would not be expected to pose a collision risk to birds. Some birds like cormorants and gulls may be attracted to these structures and opportunistically roost on these structures.	The installation of future new structures in the marine or onshore environment over the next 35 years would not be expected to cause an increase in collision risk or to result in displacement. Some potential for attraction and opportunistic roosting exists but would be expected to be limited given the anticipated number of structures.
Traffic: Aircraft	General aviation accounts for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2022). In addition to general aviation, aircraft are used for scientific and academic surveys in marine environments.	Bird fatalities associated with general aviation would be expected to increase with the current trend in commercial air travel. Aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and pre-construction surveys. These flights would be well below the 100,000 flights and no bird strikes would be expected to occur.
Land disturbance: Onshore construction	Onshore construction activity will continue at current trends. There is some potential for indirect impacts associated with habitat loss and fragmentation.	Future non-offshore-wind development would continue to occur at the current rate. This development has the potential to result in habitat loss but would not be expected to result in injury or mortality of individuals.

hazmat = hazardous materials

Table D1-5. Summary of non-offshore-wind activities and the associated impact-producing factors for coastal habitat and fauna

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental release and discharge	See Table D1-23 for a discussion of ongoing accidental releases. Accidental releases of hazmat occur periodically, mostly consisting of fuels, lubricating oils, and other petroleum compounds. Because most of these materials tend to float in seawater, they rarely contact benthic coastal resources. The chemicals with potential to sink or dissolve rapidly often dilute to non-toxic levels before they affect coastal resources. The corresponding impacts on coastal resources are rarely noticeable.	Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. See the previous cell and Table D1-23 on water quality for details.
Anchoring	Regular vessel anchoring related to ongoing military, survey, commercial, and recreational activities continue to cause temporary to permanent impacts in the immediate area where anchors and chains meet the seafloor. These impacts include increased turbidity levels and the potential for direct contact to cause injury and mortality of coastal benthic resources, as well as physical damage to their habitats. All impacts are localized; turbidity is temporary; injury and mortality is permanent for individuals but populations would recover in the short term; and physical damage can be permanent if it occurs in eelgrass beds or hard bottom.	No future activities were identified within the geographic analysis area for coastal habitat and fauna other than ongoing activities.
Cable emplacement and maintenance	Cable maintenance activities infrequently disturb coastal resources and cause temporary increases in suspended sediment; these disturbances would be localized and limited to the emplacement corridor. New cables are infrequently added near shore. Cable emplacement/maintenance activities injure and kill coastal benthic resources and result in temporary to long-term habitat alterations. The intensity of impacts depends on the time (season) and place (habitat type) where the activities occur.	No future activities were identified within the geographic analysis area for coastal habitat and fauna other than ongoing activities.
Electric and magnetic fields and cable heat	Electromagnetic fields (EMFs) continuously emanate from existing telecommunication and electrical power transmission cables. New cables generating EMFs are infrequently installed in the geographic analysis area. Some benthic species can detect EMFs, although EMFs do not appear to present a barrier to movement. The extent of impacts (behavioral changes) is likely less than 50 feet (15.2 meters) from the cable and the intensity of impacts on coastal benthic resources is likely undetectable.	No future activities were identified within the geographic analysis area for coastal habitat and fauna other than ongoing activities.
Light	Buoys, towers, and onshore structures with lights can attract coastal fauna. Onshore structures like houses and ports emit a great deal more light than offshore buoys and towers. Light from structures is widespread and permanent near the coast, but minimal offshore.	Light from onshore structures is expected to gradually increase in proportion with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Noise: Onshore construction	Onshore construction is routinely used in generic infrastructure projects. Equipment could potentially cause displacement. Any displacement would only be temporary, and no individual fitness or population-level impacts would be expected.	Onshore construction will continue at current trends. Some behavioral responses could range from avoidance behavior to mild annoyance, but no individual injury or mortality would be expected.
Presence of structures	See Table D1-3 on benthic resources.	See Table D1-3 on benthic resources.
Land disturbance: Onshore construction	Onshore residential, commercial, and industrial development are expected to continue at current trends. Construction activities may result in loss of coastal habitat and temporary or permanent displacement and injury to or mortality of individual animals, but population-level effects would not be expected.	Future non-offshore-wind development would continue to occur at the current rate. This development has the potential to result in habitat loss but would not be expected to result in injury or mortality of individuals.
Land disturbance: Onshore land use changes	Ongoing development of onshore properties, especially shoreline parcels, periodically causes the conversion of onshore coastal habitats to become developed space. Onshore construction activity will continue at current trends. There is some potential for indirect impacts associated with habitat loss and fragmentation.	Future non-offshore-wind development would continue to occur at the current rate. This development has the potential to result in habitat loss but would not be expected to result in injury or mortality of individuals.
Traffic: Vehicle collisions	Vehicle collisions may result in injury to or mortality of individual animals, but population-level effects would not be expected.	Impacts from vehicle collisions with wildlife are expected to continue and to occur at the current rate.

Table D1-6. Summary of non-offshore-wind activities and the associated impact-producing factors for commercial fisheries and for-hire recreational fishing

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Anchoring	Impacts from anchoring occur due to ongoing military, survey, commercial, and recreational activities. The short-term, localized impact on this resource is the presence of a navigational hazard (anchored vessel) to fishing vessels.	Impacts from anchoring may occur on a semi-regular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and recreational vessel traffic. Anchoring could pose a temporary (hours to days), localized (within a few hundred meters of anchored vessel) navigational hazard to fishing vessels.
Cable emplacement and maintenance	New cable emplacement and infrequent cable maintenance activities disturb the seafloor, increase suspended sediment, and cause temporary displacement of fishing vessels. These disturbances would be localized and limited to the emplacement corridor.	Future new cables and cable maintenance would occasionally disturb the seafloor and cause temporary displacement in fishing vessels and increases in suspended sediment resulting in localized, short-term impacts. If the cable routes enter the geographic analysis area for this resource, short-term disruption of fishing activities would be expected.
Noise: Construction, trenching, O&M	Noise from construction occurs frequently in coastal habitats in populated areas in New England and the Mid-Atlantic, but infrequently offshore. The intensity and extent of noise from construction are difficult to generalize, but impacts are localized and temporary. Infrequent offshore trenching could occur in connection with cable installation. These disturbances are temporary and localized, and they extend only a short distance beyond the emplacement corridor. Low levels of elevated noise from operational WTGs are likely have low to no impacts on fish and no impacts at a fishery level. Noise is also created by O&M of marine minerals extraction, which has small, localized impacts on fish, but likely no impacts at a fishery level.	Noise from construction near shore is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Noise from dredging and sand and gravel mining could occur. New or expanded marine minerals extraction may increase noise during their O&M over the next 35 years. Impacts from construction, operations, and maintenance would likely be small and localized on fish, and not seen at a fishery level. Periodic trenching would be needed for repair or new installation of underground infrastructure. These disturbances would be temporary and localized, and they extend only a short distance beyond the emplacement corridor. Impacts of trenching noise on commercial fish species are typically less prominent than the impacts of the physical disturbance and sediment suspension. Therefore, fishery-level impacts are unlikely.
Noise: G&G	Ongoing site characterization surveys and scientific surveys produce noise around sites of investigation. These activities can disturb fish and invertebrates in the immediate vicinity of the investigation and can cause temporary behavioral changes. The extent depends on equipment used, noise levels, and local acoustic conditions.	Site characterization surveys, scientific surveys, and exploratory oil and gas surveys are anticipated to occur infrequently over the next 35 years. Seismic surveys used in oil and gas exploration create high-intensity impulsive noise to penetrate deep into the seabed, potentially resulting in injury or mortality to finfish and invertebrates in a small area around each sound source and short-term stress and behavioral changes to individuals over a greater area. Site characterization surveys typically use sub-bottom profiler technologies that generate less-intense sound waves more similar to common deep-water echosounders. The intensity and extent of the resulting impacts are difficult to generalize but are likely localized and temporary.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when ports or marinas, piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water or through the seabed can cause injury or mortality of finfish and invertebrates in a small area around each pile and can cause short-term stress and behavioral changes to individuals over a greater area, leading to temporary, localized impacts on commercial fisheries and for-hire recreational fishing. The extent depends on pile size, hammer energy, and local acoustic conditions.	No future activities were identified within the geographic analysis area for commercial fisheries and for-hire recreational fishing, other than ongoing activities.
Noise: Vessels	Vessel noise is anticipated to continue at levels similar to current levels. While vessel noise may have some impact on behavior, it is likely limited to brief startle and temporary stress responses. Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels.	Planned new barge route and dredging disposal sites would generate vessel noise when implemented.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance, including dredging. Port utilization is expected to increase over the next 35 years.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports, and to be able to host larger deep-draft vessels as they continue to increase in size. Port utilization is expected to increase over the next 35 years, with increased activity during construction. The ability of ports to receive the increase in vessel traffic may require port modifications, such as channel deepening, leading to localized impacts on fish populations. Port expansions could also increase vessel traffic and competition for dockside services, which could affect fishing vessels.
Presence of structures: Navigation hazard and allisions	Structures within and near the cumulative lease areas that pose potential navigation hazards include buoys and shoreline developments such as docks and ports. An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. Two types of allisions occur: drift and powered. A drift allision generally occurs when a vessel is powered down due to operator choice or power failure. A powered allision generally occurs when an operator fails to adequately control their vessel movements or is distracted.	No known reasonably foreseeable structures are proposed to be located in the geographic analysis area that could affect commercial fisheries. Vessel allisions with non-offshore-wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. The lost gear, moved by currents, can disturb habitats and potentially harm individuals, creating small, localized, short-term impacts on fish, but likely no impacts at a fishery level.	No future activities were identified within the geographic analysis area for commercial fisheries and for-hire recreational fishing, other than ongoing activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Habitat conversion and fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly sandy seascape. A large portion is homogeneous sandy seascape but there is some other hard or complex habitat. Structures are periodically added, resulting in the conversion of existing soft-bottom and hard-bottom habitat to the new hard-structure habitat. Structure-oriented fishes are attracted to these locations. These impacts are localized and can be short term to permanent. Fish aggregation may be considered adverse, beneficial, or neutral. Commercial and for-hire recreational fishing can occur near these structures. For-hire recreational fishing is more popular, as commercial mobile fishing gear risks snagging on the structures.	New cables, installed incrementally in the geographic analysis area over the next 20 to 35 years, would likely require hard protection atop portions of the route (see "Cable emplacement/ and maintenance" IPF). Any new towers, buoys, or piers would also create uncommon relief in a mostly flat seascape. Structure-oriented species could be attracted to these locations and would benefit (Claisse et al. 2014; Smith et al. 2016). This may lead to more and larger structure-oriented fish communities and larger predators opportunistically feeding on the communities, as well as increased private and for-hire recreational fishing opportunities. Soft bottom is the dominant habitat type in the region, and species that rely on this habitat would not likely experience population-level impacts (Guida et al. 2017; Greene et al. 2010). These impacts are expected to be localized and may be long term.
Presence of structures: Migration disturbances	Human structures in the marine environment (e.g., shipwrecks, artificial reefs, buoys, and oil platforms) can attract finfish and invertebrates that approach the structures during their migrations. This could slow species migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement than structure (Secor et al. 2018). There is no evidence to suggest that structures pose a barrier to migratory animals.	The infrequent installation of future new structures in the marine environment over the next 35 years may attract finfish and invertebrates that approach the structures during their migrations. This could tend to slow migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement (Secor et al. 2018). Migratory animals would likely be able to proceed from structures unimpeded. Therefore, fishery-level impacts are not anticipated.
Presence of structures: Space-use conflicts	Current structures do not result in space-use conflicts.	No future activities were identified within the geographic analysis area for commercial fisheries and for-hire recreational fishing, other than ongoing activities.
Presence of structures: Cable infrastructure	The existing offshore cable infrastructure supports the economy by transmitting electric power and communications between mainland and islands. Shoreline developments are ongoing and include docks, ports, and other commercial, industrial, and residential structures.	No future activities were identified within the geographic analysis area for commercial fisheries and for-hire recreational fishing, other than ongoing activities.
Traffic: Vessels and vessel collisions	No substantial changes are anticipated to the vessel traffic volumes. The geographic analysis area would continue to have numerous ports and the extensive marine traffic related to shipping, fishing, and recreation would continue to be important to the region's economy. The region's substantial marine traffic may result in occasional collisions. Vessels need to navigate around structures to avoid allisions. When multiple vessels need to navigate around a structure, then navigation is more complex, as the vessels need to avoid both the structure and each other. The risk for collisions is ongoing but infrequent.	New vessel traffic in the geographic analysis area would consistently be generated by proposed barge routes and dredging demolition sites. Marine commerce and related industries would continue to be important to the regional economy.

Table D1-7. Summary of non-offshore-wind activities and the associated impact-producing factors for cultural resources

Associated IPF: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/fluids/ hazmat	See Table D1-23 for water quality for a quantitative analysis of these risks. Accidental releases of fuel/fluids/ hazmat occur during vessel use for recreational, fisheries, marine transportation, or military purposes, and other ongoing activities. Both released fluids and cleanup activities that require the removal of contaminated soils or seafloor sediments can cause impacts on cultural resources because resources are affected by the released chemicals as well as the ensuing cleanup activities.	Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases within the geographic analysis area for cultural resources, increasing the frequency of small releases. Although the majority of anticipated accidental releases would be small, resulting in small-scale impacts on cultural resources, a single, large-scale accidental release such as an oil spill could have significant impacts on marine and coastal cultural resources. A large-scale release would require extensive cleanup activities to remove contaminated materials, resulting in damage to or complete removal of terrestrial and marine cultural resources. In addition, the accidentally released materials in deep-water settings could settle on seafloor cultural resources such as wreck sites, accelerating their decomposition or covering them and making them inaccessible/unrecognizable to researchers, resulting in a significant loss of historic information. As a result, although considered unlikely, a large-scale accidental release and associated cleanup could result in permanent, geographically extensive, and large-scale impacts on cultural resources.
Accidental releases: Trash and debris	Accidental releases of trash and debris occur during vessel use for recreational, fisheries, marine transportation, or military purposes and other ongoing activities. While the released trash and debris can directly affect cultural resources, the majority of impacts associated with accidental releases occur during cleanup activities, especially if soil or sediment removed during cleanup affect known and undiscovered archaeological resources. In addition, the presence of large amounts of trash on shorelines or the ocean surface can affect the cultural value of traditional cultural properties (TCPs) for stakeholders. State and federal laws prohibiting large releases of trash would limit the size of any individual release and ongoing local, state, and federal efforts to clean up trash on beaches and waterways would continue to mitigate the effects of small-scale accidental releases of trash.	Future activities with the potential to result in accidental releases include construction and operations of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications). Accidental releases would continue at current rates along the Northeast Atlantic coast.
Anchoring	The use of vessel anchoring and gear (i.e., wire ropes, cables, chain, sweep on the seafloor) that disturbs the seafloor, such as bottom trawls and anchors, by military, recreational, industrial, and commercial vessels can affect cultural resources by physically damaging maritime archaeological resources such as shipwrecks and debris fields.	Future activities with the potential to result in anchoring/gear utilization include construction and operations of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); military use; marine transportation; fisheries use and management; and oil and gas activities. These activities are likely to continue to occur at current rates along the entire coast of the eastern United States.
Cable emplacement and maintenance	Infrequent cable maintenance activities disturb the seafloor and could cause impacts on submerged archaeological resources. These disturbances would be localized and limited to emplacement corridors.	Future activities with the potential to result in seafloor disturbances similar to offshore impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; and oil and gas activities. Such activities could cause impacts on submerged archaeological resources including shipwrecks and formerly subaerially exposed pre-contact Native American archaeological sites.
Gear utilization: Dredging	Activities associated with dredge operations and activities could damage marine archaeological resources. Ongoing activities identified by BOEM with the potential to result in dredging impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities.	Dredging activities would gradually increase through time as new offshore infrastructure is built, such as gas pipelines and electrical lines, and as ports and harbors are expanded or maintained.
Land disturbance: Onshore construction	Onshore construction activities can affect archaeological resources by damaging or removing resources.	Future activities that could result in terrestrial land disturbance impacts include onshore residential, commercial, industrial, and military development activities in the central Atlantic, particularly those proximate to offshore ECCs and interconnection facilities. Onshore construction would continue at current rates.
Lighting: Vessels	Light associated with military, commercial, or construction vessel traffic can temporarily affect coastal historic structures and TCP resources when the addition of intrusive, modern lighting changes the physical environment (“setting”) of cultural resources. The impacts of construction and operational lighting would be limited to cultural resources on the shoreline for which a nighttime sky is a contributing element to historic integrity. This excludes resources that are closed at night, such as historic buildings, lighthouses, and battlefields, and resources that generate their own nighttime light, such as historic districts. Offshore construction activities that require increased vessel traffic, construction vessels stationed offshore, and construction area lighting for prolonged periods can cause more sustained and significant visual impacts on coastal historic structure and TCP resources.	Future activities with the potential to result in vessel lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time.

Associated IPF: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Lighting: Structures	The construction of new structures that introduce new light sources into the setting of historic architectural properties or TCPs can result in impacts, particularly if the historic or cultural significance of the resource is associated with uninterrupted nighttime skies or periods of darkness. Any tall structure (e.g., commercial building, radio antenna, large satellite dishes) requiring nighttime hazard lighting to prevent aircraft collision can cause these types of impacts.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Presence of structures	The only existing offshore structures within the viewshed of the geographic analysis area are minor features such as buoys.	Non-offshore-wind structures that could be viewed would be limited to meteorological towers. Marine activity would also occur within the marine viewshed of the geographic analysis area.

hazmat = hazardous materials

Table D1-8. Summary of non-offshore-wind activities and the associated impact-producing factors for demographics, employment, and economics

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Cable emplacement and maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be localized and limited to emplacement corridors. There are six existing power cables in the geographic analysis area for demographics, employment, and economics.	Future new cables would disturb the seafloor and cause temporary increases in suspended sediment resulting in infrequent, localized, short-term impacts over the next 35 years.
Land disturbance: Onshore construction	Onshore development activities support local population growth, employment, and economics. Disturbances can cause temporary, localized traffic delays and restricted access to adjacent properties. The rate of onshore land disturbance is expected to continue at or near current rates.	Onshore development projects would be ongoing in accordance with local government land use plans and regulations.
Lighting: Structures	Offshore buoys and towers emit low-intensity light, while onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Lighting: Vessels	Ocean vessels have an array of lights including navigational lights and deck lights.	Anticipated modest growth in vessel traffic would result in some growth in the nighttime traffic of vessels with lighting.
Noise: Cable laying/ trenching	Infrequent trenching for pipeline and cable-laying activities emit noise. These disturbances are temporary and localized and extend only a short distance beyond the emplacement corridor. Impacts of trenching noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	Periodic trenching would be needed over the next 35 years for repair or new installation of underground infrastructure.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. These disturbances are temporary and localized and extend only a short distance beyond the work area.	No future activities were identified within the geographic analysis area for demographics, employment, and economics other than ongoing activities.
Noise: Vessels	Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Planned new barge route and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance. The New Jersey Wind Port is being developed and the Paulsboro Marine Terminal is being upgraded specifically to support the construction of offshore wind energy facilities.	Ports would need to perform maintenance and upgrade facilities over the next 35 years to ensure that they can still receive the projected future volume of vessels visiting their ports, and to be able to host larger deep-draft vessels as they continue to increase in size.
Port utilization: Maintenance/dredging	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. As ports expand, maintenance dredging of shipping channels is expected to increase.	Ports would need to perform maintenance and upgrades over the next 35 years to ensure that they can still receive the projected future volume of vessels visiting their ports, and to be able to host larger deep-draft vessels as they continue to increase in size.
Presence of structures: Allisions	An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. The likelihood of allisions is expected to continue at or near current levels.	Vessel allisions with non-offshore-wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. Such loss and damage are direct costs for gear owners and are expected to continue at or near current levels.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented fishes are attracted to these locations, which may be known as Fish Aggregating Devices (FADs). Recreational and commercial fishing can occur near the FADs, although recreational fishing is more popular, because commercial mobile fishing gear is more likely to snag on FADs.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Habitat conversion	Structures, including foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented species thus benefit on a constant basis.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions, especially in nearshore areas. This navigation becomes more complex when multiple vessels must navigate around a structure, because vessels need to avoid both the structure and each other.	Vessel traffic, overall, is not expected to meaningfully increase over the next 35 years. The presence of navigation hazards is expected to continue at or near current levels.
Presence of structures: Space-use conflicts	Current structures do not result in space-use conflicts.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Viewshed	No existing offshore structures are within the viewshed of the offshore wind lease area except buoys.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Transmission cable infrastructure	The existing offshore cable infrastructure supports the economy by transmitting electric power and communications between mainland and islands. Additional communication cables run between the U.S. East Coast and European countries along the eastern Atlantic.	No known proposed structures not associated with offshore wind development are reasonably foreseeable.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Traffic: Vessels	Ports and marine traffic related to shipping, fishing, and recreation are important to the region's economy. No substantial changes are anticipated to existing vessel traffic volumes.	New vessel traffic near the geographic analysis area would be generated by proposed barge routes and dredging demolition sites over the next 35 years. Marine commerce and related industries would continue to be important to the geographic analysis area economy.
Traffic: Vessel collisions	The region's substantial marine traffic may result in occasional vessel collisions, which would result in costs to the vessels involved. The likelihood of collisions is expected to continue at or near current rates.	No substantial changes are anticipated.

FAD = fish aggregating device

Table D1-9. Summary of non-offshore-wind activities and the associated impact-producing factors for environmental justice

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Air emissions: Construction/ decommissioning	Ongoing population growth and new development within the geographic analysis area is likely to increase traffic, with resulting increases in emissions from motor vehicles. Some new industrial development may result in emission-producing uses. At the same time, many industrial waterfront areas near environmental justice communities are losing industrial uses and converting to more commercial or residential uses.	New developments may include emission-producing industry and new developments that would increase emissions from motor vehicles. Some historically industrial waterfront locations will continue to lose industrial uses, with no new industrial development to replace it.
Air emissions: O&M	Ongoing population growth and new development within the geographic analysis area is likely to increase traffic, with resulting increase in emissions from motor vehicles. Some new industrial development may result in emission-producing uses. At the same time, many industrial waterfront areas near environmental justice communities are losing industrial uses and converting to more commercial or residential uses.	New developments may include emission-producing industry and new developments that would increase emissions from motor vehicles. Some historically industrial waterfront locations will continue to lose industrial uses, with no new industrial development to replace it.
Cable emplacement and maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be localized and limited to emplacement corridors.	Future new cables would disturb the seafloor and cause temporary increases in suspended sediment, resulting in infrequent, localized, short-term impacts over the next 35 years.
Land disturbance: Erosion and sedimentation	Potential erosion and sedimentation from development and construction are controlled by local and state development regulations.	New development activities would be subject to erosion and sedimentation regulations.
Land disturbance: Onshore construction	Onshore development supports local population growth, employment, and economics.	Onshore development would continue in accordance with local government land use plans and regulations.
Land disturbance: Onshore, land use changes	Onshore development would result in changes in land use in accordance with local government land use plans and regulations.	Development of onshore solar and wind energy would provide diversified, small-scale energy generation.
Lighting: Structures	Offshore buoys and towers emit low-intensity light, while onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. These disturbances are temporary and localized, and they extend only a short distance beyond the work area.	No future activities were identified within the geographic analysis area other than ongoing activities.
Noise: Trenching	Infrequent trenching for pipeline and cable-laying activities emits noise. These disturbances are temporary and localized, and they extend only a short distance beyond the emplacement corridor. Impacts of trenching noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	Periodic trenching would be needed over the next 35 years for repair or new installation of underground infrastructure.
Noise: Vessels	Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels.	Vessel noise is anticipated to continue at or near current levels.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance. The New Jersey Wind Port is being developed and the Paulsboro Marine Terminal is being upgraded specifically to support the construction of offshore wind energy facilities.	Ports would need to perform maintenance and upgrade facilities to ensure that they can still receive the projected future volume of vessels visiting their ports, and to be able to host larger deep-draft vessels as they continue to increase in size.
Presence of structures: Entanglement, gear loss/ damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. Such loss and damage are direct costs for gear owners and are expected to continue at or near current levels.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions, especially in nearshore areas. This navigation becomes more complex when multiple vessels must navigate around a structure, because vessels need to avoid both the structure and each other.	Vessel traffic is generally not expected to meaningfully increase over the next 35 years. The presence of navigation hazards is expected to continue at or near current levels.
Presence of structures: Space-use conflicts	Current structures do not result in space-use conflicts.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Viewshed	There are no existing offshore structures within the viewshed of the offshore wind lease area except buoys.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Cable infrastructure	Existing submarine cables cross cumulative lease areas.	Existing cable O&M activities would continue within the geographic analysis area.

Table D1-10. Summary of non-offshore-wind activities and the associated impact-producing factors for finfish, invertebrates, and essential fish habitat

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/ fluids/hazmat	See Table D1-23 for a quantitative analysis of these risks. Ongoing releases are frequent/chronic. Impacts, including mortality, decreased fitness, and contamination of habitat, are localized and temporary, and rarely affect populations.	See Table D1-23 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Impacts are unlikely to affect populations.
Accidental releases: Invasive species	Invasive species are periodically released accidentally during ongoing activities, including the discharge of ballast water and bilge water from marine vessels. The resulting impacts on invertebrates and finfish depend on many factors but can be widespread and permanent, especially if the invasive species becomes established and outcompetes native species. The impacts on finfish, invertebrates, and EFH depend on many factors, but can be widespread and permanent.	No future activities were identified within the geographic analysis area for finfish, invertebrates, and essential fish habitat, other than ongoing activities.
Anchoring	Vessel anchoring related to ongoing military use and survey, commercial, and recreational activities continue to cause temporary to permanent impacts in the immediate area where anchors and chains meet the seafloor. Impacts on finfish, invertebrates, and EFH are greatest for sensitive EFH (e.g., eelgrass, hard bottom) and sessile or slow-moving species (e.g., corals, sponges, and sedentary shellfish).	Impacts from anchoring may occur on a semi-regular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and recreational vessel traffic. These impacts would include increased turbidity levels and potential for direct contact causing mortality of benthic species and, possibly, degradation of sensitive habitats. All impacts would be localized, turbidity would be temporary, and impacts from direct contact would be recovered in the short term. Degradation of sensitive habitats such as certain types of hard bottom (e.g., boulder piles), if it occurs, could be long term.
Cable emplacement and maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances are localized and limited to the cable corridor. New cables are infrequently added near shore. Cable emplacement/maintenance activities disturb, displace, and injure finfish and invertebrates and result in temporary to long-term habitat alterations. The intensity of impacts depends on the time (season) and place (habitat type) where the activities occur. (See also the IPF of Sediment deposition and burial.)	Future new cables would occasionally disturb the seafloor and cause temporary increases in suspended sediment, resulting in localized short-term impacts. If the cable routes enter the geographic analysis area for this resource, short-term disturbance would be expected. The intensity of impacts would depend on the time (season) and place (habitat type) where the activities would occur.
Cable emplacement/ maintenance: Seabed profile alterations	Ongoing sediment dredging for navigation purposes results in localized, short-term impacts (habitat alteration, change in complexity) on finfish, invertebrates, and EFH through this IPF. Dredging is most likely in sand wave areas where typical jet plowing is insufficient to meet target cable burial depth. Sand waves that are dredged would likely be redeposited in like-sediment areas. Any particular sand wave may not recover to the same height and width as pre-disturbance; however, the habitat function would largely recover post-disturbance. Therefore, seabed profile alterations, while locally intense, have little impact on finfish, invertebrates, and EFH on a regional (Cape Hatteras to Gulf of Maine) scale.	No future activities were identified within the geographic analysis area for finfish, invertebrates, and essential fish habitat, other than ongoing activities.
Cable emplacement and maintenance: Sediment deposition and burial	Ongoing sediment dredging for navigation purposes results in fine sediment deposition. Ongoing cable maintenance activities also infrequently disturb bottom sediments; these disturbances are localized and limited to the emplacement corridor. Sediment deposition could have negative impacts on eggs and larvae, particularly demersal eggs such as longfin squid, which are known to have high rates of egg mortality if egg masses are exposed to abrasion or burial. Impacts may vary based on season/time of year.	No future activities were identified within the geographic analysis area for finfish, invertebrates, and essential fish habitat, other than ongoing activities.
Discharge/intakes	Water quality impacts from ongoing onshore and offshore activities affect nearshore habitats, and accidental spills can occur from pipeline or marine shipping. Invasive species can be accidentally released in the discharge of ballast water and bilge water from marine vessels.	No future activities were identified within the geographic analysis area for finfish, invertebrates, and essential fish habitat, other than ongoing activities.
Electric and magnetic fields and cable heat	EMF emanates continuously from installed telecommunication and electrical power transmission cables. Biologically significant impacts on finfish, invertebrates, and EFH have not been documented for AC cables (CSA Ocean Sciences, Inc. and Exponent 2019; Thomsen et al. 2015), but behavioral impacts have been documented for benthic species (skates and lobster) near operating DC cables (Hutchison et al. 2018). The impacts are localized and affect the animals only while they are within the EMF. There is no evidence to indicate that EMF from undersea AC power cables negatively affects commercially and recreationally important fish species (CSA Ocean Sciences, Inc. and Exponent 2019).	During operation, future new cables would produce EMF. Submarine power cables in the geographic analysis area are assumed to be installed with appropriate shielding and burial depth to reduce potential EMF to low levels. Although the EMF would exist as long as a cable was in operation, impacts on finfish, invertebrates, and EFH would likely be difficult to detect.
Gear utilization	Abandoned or lost fishing gear remains in the aquatic environment for extended time periods, often entangling or trapping mobile invertebrate and fish species. Based on data from NOAA, bycatch affects many species throughout the geographic analysis area—most notably, windowpane flounder, blueback herring, shark species, and hake species. The majority of bycatch is a result of open area scallop trawls, large-mesh otter trawls, conch pots, and fish traps (NOAA 2019).	Future pre-construction, construction, and post-construction fisheries monitoring surveys for ongoing and planned non-offshore-wind projects would continue to harvest finfish and macroinvertebrates. These surveys could include trawl surveys (affecting finfish and squid) and clam dredge surveys (ocean quahog and surfclam). Trawl and gillnet surveys for fisheries monitoring would likely result in direct on fish, invertebrates, and essential fish habitat and has the potential to result in injury and mortality, reduced fecundity, and delayed or aborted spawning migrations.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Lighting: Vessels	Marine vessels have an array of lights including navigational lights and deck lights. There is little downward-focused lighting, and therefore only a small fraction of the emitted light enters the water. Light can attract finfish and invertebrates, potentially affecting distributions in a highly localized area. Light may also disrupt natural cycles, e.g., spawning, possibly leading to short-term impacts.	Vessels would continue to be a light source within the geographic analysis area.
Lighting: Structures	Offshore buoys and towers emit light, and onshore structures, including buildings and ports, emit a great deal more on an ongoing basis. Light can attract finfish and invertebrates, potentially affecting distributions in a highly localized area. Light may also disrupt natural cycles, e.g., spawning, possibly leading to short-term impacts. Light from structures is widespread and permanent near the coast, but minimal offshore.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Noise: Aircraft	Noise from aircraft reaches the sea surface on a regular basis. However, there is not likely to be any impact of aircraft noise on finfish, invertebrates, and EFH, as very little of the aircraft noise propagates through the water.	Aircraft noise is likely to continue to increase as commercial air traffic increases. However, there is not likely to be any impact of aircraft noise on finfish, invertebrates, and EFH.
Noise: Onshore/offshore construction	Noise from construction occurs frequently in near shores of populated areas in New England and the Mid-Atlantic but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are localized and temporary. See also sub-IPF for Noise: Pile-driving.	Noise from construction nearshore is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource.
Noise: G&G	Ongoing site characterization surveys and scientific surveys produce noise around sites of investigation. These activities can disturb finfish and invertebrates in the immediate vicinity of the investigation and can cause temporary behavioral changes. The extent depends on equipment used, noise levels, and local acoustic conditions.	Site characterization surveys, scientific surveys, and exploratory oil and gas surveys are anticipated to occur infrequently over the next 35 years. Seismic surveys used in oil and gas exploration create high-intensity, impulsive noise to penetrate deep into the seabed, potentially resulting in injury or mortality of finfish and invertebrates in a small area around each sound source and short-term stress and behavioral changes to individuals over a greater area. Site characterization surveys typically use sub-bottom profiler technologies that generate less-intense sound waves more similar to common deep-water echosounders. The intensity and extent of the resulting impacts are difficult to generalize but are likely localized and temporary.
Noise: O&M	Some finfish and invertebrates may be able to hear the continuous underwater noise of operational WTGs. As measured at the Block Island Wind Farm, this low-frequency noise barely exceeds ambient levels at 164 feet (50 meters) from the WTG base. Based on the results of Thomsen et al. (Thomsen et al. 2015), sound pressure levels (SPLs) would be expected to be at or below ambient levels at relatively short distances (approximately 164 feet [50 meters]) from WTG foundations. These low levels of elevated noise likely have little to no impact. Noise is also created by O&M of marine minerals extraction and commercial fisheries, each of which has small, localized impacts.	New or expanded marine minerals extraction and commercial fisheries may intermittently increase noise during their O&M over the next 35 years. Impacts would likely be small and localized.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water or through the seabed can cause injury or mortality of finfish and invertebrates in a small area around each pile and can cause short-term stress and behavioral changes to individuals over a greater area. Eggs, embryos, and larvae of finfish and invertebrates could also experience developmental abnormalities or mortality resulting from this noise, although thresholds of exposure are not known (Weilgart 2018; Hawkins and Popper 2017). Potentially injurious noise could also be considered as rendering EFH temporarily unavailable or unsuitable for the duration of the noise. The extent depends on pile size, hammer energy, and local acoustic conditions.	No future activities were identified within the geographic analysis area for finfish, invertebrates, and essential fish habitat, other than ongoing activities.
Noise: Cable laying/ trenching	Infrequent trenching activities for pipeline and cable laying, as well as other cable burial methods, emit noise. These disturbances are temporary and localized and extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	New or expanded submarine cables and pipelines are likely to occur in the geographic analysis area for this resource. These disturbances would be infrequent over the next 35 years, temporary, and localized, and would extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.
Noise: Vessels	While ongoing vessel noise may have some effect on behavior, it is likely limited to brief startle and temporary stress responses. Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels.	Vessels would continue to be a noise source within the geographic analysis area.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance, including dredging. Port utilization is expected to increase over the next 35 years.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. Certain types of vessel traffic have increased recently (e.g., ferry use, cruise industry) and may continue to increase in the foreseeable future. In addition, the general trend along the coast from Virginia to Maine is that port activity will increase modestly. The ability of ports to receive the increase may require port modifications, leading to localized impacts. Future channel-deepening activities will likely be undertaken. Existing ports have already affected finfish, invertebrates, and EFH, and future port projects would implement BMPs to minimize impacts. Although the degree of impacts on EFH would likely be undetectable outside the immediate vicinity of the ports, adverse

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
		impacts on EFH for certain species or life stages may lead to impacts on finfish and invertebrates beyond the vicinity of the port.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. The lost gear, moved by currents, can disturb habitats and potentially harm individuals, creating small, localized, short-term impacts.	No future activities were identified within the geographic analysis area for finfish, invertebrates, and essential fish habitat, other than ongoing activities.
Presence of structures: Hydrodynamic disturbance	Human-made structures, especially tall vertical structures such as foundations for towers of various purposes, continuously alter local water flow at a fine scale. Water flow typically returns to background levels within a relatively short distance from the structure. Therefore, impacts on finfish, invertebrates, and EFH are typically undetectable. Indirect impacts of structures influencing primary productivity and higher trophic levels are possible but are not well understood. New structures are periodically added.	Tall vertical structures can increase seabed scour and sediment suspension. Impacts would likely be highly localized and difficult to detect. Indirect impacts of structures influencing primary productivity and higher trophic levels are possible but are not well understood.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly sandy seascape. Structure-oriented fishes are attracted to these locations. These impacts are localized and often permanent. Fish aggregation may be considered adverse, beneficial, or neutral.	New cables, installed incrementally in the geographic analysis area for this resource over the next 20 to 35 years, would likely require hard protection atop portions of the route (see the Cable emplacement/maintenance IPF). Any new towers, buoys, or piers would also create uncommon relief in a mostly sandy seascape. Structure-oriented fishes could be attracted to these locations. Abundance of certain fishes may increase. These impacts are localized and may be permanent.
Presence of structures: Habitat conversion	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly sandy seascape. A large portion is homogeneous sandy seascape but there is some other hard or complex habitat. Structure-oriented species thus benefit on a constant basis; however, the diversity may decline over time as early colonizers are replaced by successional communities dominated by blue mussels and anemones (Degraer et al. 2019 [Chapter 7]). Structures are periodically added, resulting in the conversion of existing soft-bottom and hard-bottom habitat to the new hard-structure habitat.	New cable, installed incrementally in the geographic analysis area over the next 20 to 35 years, would likely require hard protection atop portions of the route (see Cable emplacement/maintenance). Any new towers, buoys, or piers would also create uncommon relief in a mostly sandy seascape. Structure-oriented species would benefit (Claisse et al. 2014; Smith et al. 2016); however, the diversity may decline over time as early colonizers are replaced by successional communities dominated by blue mussels and anemones (Degraer et al. 2019 [Chapter 7]). Soft bottom is the dominant habitat type from Cape Hatteras to the Gulf of Maine (over 60 million acres) and species that rely on this habitat would not likely experience population-level impacts (Guida et al. 2017; Greene et al. 2010).
Presence of structures: Migration disturbances	Human structures in the marine environment (e.g., shipwrecks, artificial reefs, and oil platforms) can attract finfish and invertebrates that approach the structures during their migrations. This could slow migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement than structure is (Moser and Shepherd 2009; Fabrizio et al. 2014; Secor et al. 2018). There is no evidence to suggest that structures pose a barrier to migratory animals.	The infrequent installation of future new structures in the marine environment over the next 35 years may attract finfish and invertebrates that approach the structures during their migrations. This could tend to slow migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement (Moser and Shepherd 2009; Fabrizio et al. 2014; Secor et al. 2018). Migratory animals would likely be able to proceed from structures unimpeded.
Presence of structures: Cable infrastructure	See other sub-IPFs within the Presence of structures IPF. See Table D1-5 on coastal habitats.	See other sub-IPFs within the Presence of structures IPF. See Table D1-5 on coastal habitats.

AC = alternating current; DC = direct current; hazmat = hazardous materials

Table D1-11. Summary of non-offshore-wind activities and the associated impact-producing factors for land use and coastal infrastructure

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/ fluids/hazmat	Various ongoing onshore and coastal construction projects include the use of vehicles and equipment that contain fuel, fluids, and hazmat that could be released.	Ongoing onshore construction projects involve vehicles and equipment that use fuel, fluids, or hazmat could result in an accidental release. Intensity and extent would vary depending on the size, location, and materials involved in the release.
Lighting: Structures	Various ongoing onshore and coastal construction projects have nighttime activities, as well as existing structures, facilities, and vehicles that would use nighttime lighting.	Ongoing onshore construction projects involving nighttime activity could generate nighttime lighting. Intensity and extent would vary depending on the location, type, direction, and duration of nighttime lighting.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance. The New Jersey Wind Port is being developed and the Paulsboro Marine Terminal is being upgraded specifically to support the construction of offshore wind energy facilities.	Ports would need to perform maintenance and upgrade facilities to ensure that they can still receive the projected future volume of vessels visiting their ports, and to be able to host larger deep-draft vessels as they continue to increase in size.
Presence of structures: Viewshed	The only existing offshore structures within the offshore viewshed are minor features such as buoys.	Non-offshore-wind structures that could be viewed in conjunction with the offshore components would be limited to meteorological towers. Marine activity would also occur within the marine viewshed.
Presence of structures: Cable infrastructure	Onshore buried cables would only occur where permitted by local land use authorities, which would avoid long-term land use conflicts.	No known proposed structures are reasonably foreseeable and proposed to be located in the geographic analysis area for land use and coastal infrastructure.
Land disturbance: Onshore construction	Onshore construction supports local population growth, employment, and economics.	Onshore development would continue in accordance with local government land use plans and regulations.
Land disturbance: Onshore, land use changes	New development or redevelopment would result in changes in land use in accordance with local government land use plans and regulations.	Ongoing and future development and redevelopment is anticipated to reinforce existing land use patterns, based on local government planning documents.
Traffic	Onshore construction is not anticipated to noticeably add to the traffic of the local roadway system.	Onshore ongoing and planned development would likely disrupt road traffic for a short period of time depending on the type of development.

hazmat = hazardous materials

Table D1-12. Summary of non-offshore-wind activities and the associated impact-producing factors for marine mammals

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/fluids/hazmat	See Table D1-23 for a quantitative analysis of these risks. Ongoing releases are frequent/chronic. Marine mammal exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality or sublethal effects on individual fitness, including adrenal effects, hematological effects, liver effects, lung disease, poor body condition, skin lesions, and several other health effects attributed to oil exposure (Kellar et al. 2017; Mazet et al. 2001; Mohr et al. 2008; Smith et al. 2017; Sullivan et al. 2019; Takeshita et al. 2017). Additionally, accidental releases may result in impacts on marine mammals due to effects on prey species (Table D1-10).	See Table D1-23 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Marine mammal exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality or sublethal effects on individual fitness, including adrenal effects, hematological effects, liver effects, lung disease, poor body condition, skin lesions, and several other health effects attributed to oil exposure (Kellar et al. 2017; Mazet et al. 2001; Mohr et al. 2008; Smith et al. 2017; Sullivan et al. 2019; Takeshita et al. 2017). Additionally, accidental releases may result in impacts on marine mammals due to effects on prey species (Table D1-10).
Accidental releases: Trash and debris	Trash and debris may be accidentally discharged through fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities and cables, lines and pipeline laying, and debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low-quantity, localized, and low-impact events. Worldwide 62 of 123 (50.4%) marine mammal species have been documented ingesting marine litter (Werner et al. 2016). Stranding data indicate potential debris-induced mortality rates of 0 to 22%. Mortality has been documented in cases of debris interactions, as well as blockage of the digestive tract, disease, injury, and malnutrition (Baulch and Perry 2014). However, it is difficult to link physiological effects on individuals to population-level impacts (Browne et al. 2015).	As population and vessel traffic increase gradually over the next 35 years, accidental release of trash and debris may increase. Trash and debris may continue to be accidentally released through fisheries use and other offshore and onshore activities. There may also be a long-term risk from exposure to plastics and other debris in the ocean. Worldwide 62 of 123 (50.4%) of marine mammal species have been documented ingesting marine litter (Werner et al. 2016). Mortality has been documented in cases of debris interactions, as well as blockage of the digestive tract, disease, injury, and malnutrition (Baulch and Perry 2014).
Cable emplacement and maintenance	Cable maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances will be localized and generally limited to the emplacement corridor. Data are not available regarding marine mammal avoidance of localized turbidity plumes; however, Todd et al. (2015) suggest that because some marine mammals often live in turbid waters and some species of mysticetes and sirenians employ feeding methods that create sediment plumes, some species of marine mammals have a tolerance for increased turbidity. Similarly, McConnell et al. (1999) documented movements and foraging of gray seals in the North Sea. One tracked individual was blind in both eyes, but otherwise healthy. Despite the individual's blindness, observed movements were typical of the other study individuals, indicating that visual cues are not essential for gray seal foraging and movement (McConnell et al. 1999). If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any impacts would be temporary and short term. Turbidity associated with increased sedimentation may result in temporary, short-term impacts on marine mammal prey species (Table D1-10).	The impact on water quality from accidental sediment suspension during cable emplacement is temporary and short term. If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any negative impacts would be temporary and short term. Turbidity associated with increased sedimentation may result in temporary, short-term impacts on some marine mammal prey species (Table D1-10).
Electric and magnetic fields and cable heat	EMFs emanate constantly from installed telecommunication and electrical power transmission cables. Marine mammals appear to have a detection threshold for magnetic intensity gradients (i.e., changes in magnetic field levels with distance) of 0.1% of the Earth's magnetic field or about 0.05 μT (Kirschvink 1990) and are thus likely to be very sensitive to minor changes in magnetic fields (Walker et al. 2003). There is a potential for animals to react to local variations of the geomagnetic field caused by power cable EMFs. Depending on the magnitude and persistence of the confounding magnetic field, such an effect could cause a trivial temporary change in swim direction or a longer detour during the animal's migration (Gill et al. 2005). Such an effect on marine mammals is more likely to occur with direct current cables than with AC cables (Normandeau et al. 2011). However, there are numerous transmission cables installed across the seafloor and no impacts on marine mammals have been demonstrated from this source of EMF.	During operation, future new cables would produce EMF. Submarine power cables in the marine mammal geographic analysis area are assumed to be installed with appropriate shielding and burial depth to reduce potential EMF to low levels. EMF of any two sources would not overlap. Although the EMF would exist as long as a cable was in operation, impacts, if any, would likely be difficult to detect, if they occur at all. Marine mammals have the potential to react to submarine cable EMF; however, no effects from the numerous submarine cables have been observed. Furthermore, this IPF would be limited to extremely small portions of the areas used by migrating marine mammals. As such, exposure to this IPF would be low and impacts on marine mammals would not be expected.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water or through the seabed can result in high-intensity, low-exposure-level, long-term, but localized intermittent risk to marine mammals. Impacts would be localized in nearshore waters. Pile-driving activities may negatively affect marine mammals during foraging, orientation, migration, predator detection, social interactions, or other activities (Southall et al. 2007). Noise exposure associated with pile-driving activities can interfere with these functions and has the potential to cause a range of responses, including insignificant behavioral changes, avoidance of the ensonified area, PTS, harassment, and ear injury, depending on the intensity and duration of the exposure. BOEM assumes that all ongoing and potential future activities will be conducted in accordance with a project-specific Incidental Harassment Authorization to minimize impacts on marine mammals.	No future activities were identified within the marine mammal geographic analysis area for marine mammals, other than ongoing activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Noise: G&G	Infrequent site characterization surveys and scientific surveys produce high-intensity, impulsive noise around sites of investigation. These activities have the potential to result in high-intensity, high-consequence impacts, including auditory injuries, stress, disturbance, and behavioral responses, if marine mammals are present within the ensonified area (NOAA 2018). Survey protocols and underwater noise mitigation procedures are typically implemented to decrease the potential for any marine mammal to be within the area where sound levels are above relevant harassment thresholds associated with an operating sound source to reduce the potential for behavioral responses and injury (permanent threshold shifts [PTS]/temporary threshold shifts [TTS]) close to the sound source. The magnitude of effects, if any, is intrinsically related to many factors, including acoustic signal characteristics, behavioral state (e.g., migrating), biological condition, distance from the source, duration and level of the sound exposure, and environmental and physical conditions that affect acoustic propagation (NOAA 2018).	Same as ongoing activities, with the addition of possible future oil and gas exploration surveys.
Noise: Vessels	Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, scientific and academic research vessels, and other construction vessels. The frequency range for vessel noise falls within marine mammals' known range of hearing and would be audible. Noise from vessels presents a long-term and widespread impact on marine mammals across most oceanic regions. While vessel noise may have some effect on marine mammal behavior, it would be expected to be limited to brief startle and temporary stress response. Results from studies on acoustic impacts from vessel noise on odontocetes indicate that small vessels at a speed of 5 knots in shallow coastal water can reduce the communication range for bottlenose dolphins within 164 feet (50 meters) of the vessel by 26% (Jensen et al. 2009). Pilot whales in a quieter, deep-water habitat could experience a 50% reduction in communication range from a similar size boat and speed (Jensen et al. 2009). Because lower frequencies propagate farther away from the sound source compared to higher frequencies, low frequency cetaceans (LFC) are at a greater risk of experiencing Level B Harassment produced by vessel traffic.	Any offshore projects that require the use of ocean vessels could potentially result in long-term but infrequent impacts on marine mammals, including temporary startle responses, masking of biologically relevant sounds, physiological stress, and behavioral changes. However, BOEM expects that these brief responses of individuals to passing vessels would be unlikely given the patchy distribution of marine mammals. No stock or population-level effects would be expected.
Noise: Aircraft	Aircraft routinely travel in the marine mammal geographic analysis area. With the possible exception of rescue operations, no ongoing aircraft flights would occur at altitudes that would elicit a response from marine mammals. If flights are at a sufficiently low altitude, marine mammals may respond with behavioral changes, including short surface durations, abrupt dives, and percussive behaviors (i.e., breaching and tail slapping) (Patenaude et al. 2002). Similarly, aircraft have the potential to disturb hauled-out seals if aircraft overflights occur within 2,000 feet (610 meters) of a haul-out area (Efroymson et al. 2000). However, this disturbance would be temporary and short term, and result in minimal energy expenditure. These brief responses would be expected to dissipate once the aircraft has left the area.	Future low-altitude aircraft activities such as survey activities and navy training operations could result in short-term responses of marine mammals to aircraft noise. If flights are at a sufficiently low altitude, marine mammals may respond with behavioral changes, including short surface durations, abrupt dives, and percussive behaviors (i.e., breaching and tail slapping) (Patenaude et al. 2002). These brief responses would be expected to dissipate once the aircraft has left the area.
Noise: Cable laying/trenching	Noise from cable laying could periodically occur in the geographic analysis area.	No future activities were identified within the marine mammal geographic analysis area for marine mammals, other than ongoing activities.
Noise: Turbines	Marine mammals would be able to hear the continuous underwater noise of operational WTGs. As measured at the Block Island Wind Farm, this low-frequency noise barely exceeds ambient levels at 164 feet (50 meters) from the WTG base. Based on the results of Thomsen et al. (2015) and Kraus et al. (2016), SPLs would be expected to be at or below ambient levels at relatively short distances from the WTG foundations.	This sub-IPF does not apply to future non-offshore-wind development.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance. Port expansion activities are localized to nearshore habitats and are expected to result in temporary, short-term impacts, if any, on marine mammals. Vessel noise may affect marine mammals, but response would be expected to be temporary and short term (see Vessels: Noise sub-IPF above). The impacts on water quality from sediment suspension during port expansion activities is temporary and short term and would be similar to those described under the Cable emplacement/maintenance IPF above.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. In addition, the general trend along the coastal region from Virginia to Maine is that port activity will increase modestly. The ability of ports to receive the increase in larger ships will require port modifications. Future channel-deepening activities are being undertaken to accommodate deeper-draft vessels for the Panama Canal Locks. The additional traffic and larger vessels could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. The increased sediment suspension could be long-term depending on the vessel traffic increase. Certain types of vessel traffic have increased recently (e.g., ferry use, cruise industry) and may continue to increase in the foreseeable future. Additional impacts associated with the increased risk of vessel strike could also occur (see the Traffic: Vessel collisions sub-IPF below).
Presence of structures: Entanglement or ingestion of lost fishing gear	There are more than 130 artificial reefs in the Mid-Atlantic region. This sub-IPF may result in long-term, high-intensity impacts, but with low exposure due to localized and geographic spacing of artificial reefs. Currently bridge foundations and the Block Island Wind Farm may be considered artificial reefs and may have higher	No future activities were identified within the marine mammal geographic analysis area for marine mammals, other than ongoing activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
	levels of recreational fishing, which increases the chances of marine mammals encountering lost fishing gear, resulting in possible ingestions, entanglement, injury, or death of individuals (Moore and van der Hoop 2012) if present nearshore where these structures are located. There are very few, if any, areas within the OCS geographic analysis area for marine mammals that would serve to concentrate recreational fishing and increase the likelihood that marine mammals would encounter lost fishing gear.	
Presence of structures: Habitat conversion and prey aggregation	There are more than 130 artificial reefs in the Mid-Atlantic region. Hard bottom (scour control and rock mattresses) and vertical structures (bridge foundations and Block Island Wind Farm WTGs) in a soft-bottom habitat can create artificial reefs, thus inducing the “reef effect” (Taormina et al. 2018; NMFS 2015). The reef effect is usually considered a beneficial impact associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for seals and small odontocetes compared to the surrounding soft bottoms.	The presence of structures associated with non-offshore-wind development in nearshore coastal waters has the potential to provide habitat for seals and small odontocetes as well as preferred prey species. This “reef effect” has the potential to result in long-term, low-intensity benefits. Bridge foundations will continue to provide foraging opportunities for seals and small odontocetes with measurable benefits to some individuals. Hard bottom (scour control and rock mattresses used to bury the offshore export cables) and vertical structures (i.e., WTG and OSS foundations) in a soft-bottom habitat can create artificial reefs, thus inducing the reef effect (Taormina et al. 2018; Causon and Gill 2018). The reef effect is usually considered a beneficial impact associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for marine mammals compared to the surrounding soft bottoms.
Presence of structures: Avoidance/ displacement	No ongoing activities in the marine mammal geographic analysis area beyond offshore wind facilities are measurably contributing to this sub-IPF. There may be some impacts resulting from the existing Block Island Wind Farm, but given that there are only five WTGs, no measurable impacts are occurring.	Not contemplated for non-offshore-wind facility sources.
Presence of structures: Behavioral disruption — breeding and migration	No ongoing activities in the marine mammal geographic analysis area beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non-offshore-wind facility sources.
Presence of structures: Displacement into higher risk areas (vessels and fishing)	No ongoing activities in the marine mammal geographic analysis area beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non-offshore-wind facility sources.
Traffic: Vessel collisions.	Current activities that are contributing to this sub-IPF include port traffic levels, fairways, TSS, commercial vessel traffic, recreational and fishing activity, and scientific and academic vessel traffic. Vessel strike is relatively common with cetaceans (Kraus et al. 2005) and one of the primary causes of death to NARWs, with as many as 75% of known anthropogenic mortalities of NARWs likely resulting from collisions with large ships along the U.S. and Canadian eastern seaboard (Kite-Powell et al. 2007). Marine mammals are more vulnerable to vessel strike when they are within the draft of the vessel and when they are beneath the surface and not detectable by visual observers. Some conditions that make marine mammals less detectable include weather conditions with poor visibility (e.g., fog, rain, wave height) or nighttime operations. Vessels operating at speeds exceeding 10 knots have been associated with the highest risk for vessel strikes of NARWs (Vanderlaan and Taggart 2007). Reported vessel collisions with whales show that serious injury rarely occurs at speeds below 10 knots (Laist et al. 2001). Data show that the probability of a vessel strike increases with the velocity of a vessel (Pace and Silber 2005; Vanderlaan and Taggart 2007).	Vessel traffic associated with non-offshore-wind development has the potential to result in an increased collision risk. While these impacts would be of high consequence, the patchy distribution of marine mammals makes stock or population-level effects unlikely (Navy 2018).

µT = microtesla; AC = alternating current; hazmat = hazardous materials

Table D1-13. Summary of non-offshore-wind activities and the associated impact-producing factors for navigation and vessel traffic

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Anchoring	Larger commercial vessels (specifically tankers) sometimes anchor outside of major ports to transfer their cargo to smaller vessels for transport into port, an operation known as lightering. These anchors have deeper ground penetration and are under higher stresses. Smaller vessels (commercial fishing or recreational vessels) would anchor for fishing and other recreational activities. These activities cause temporary to short-term impacts on navigation in the immediate anchorage area. All vessels may anchor in an emergency scenario (such as power loss) if they lose power to prevent them from drifting and creating navigational hazards for other vessels or drifting into structures.	Lightering and anchoring operations are expected to continue at or near current levels, with the expectation of moderate increases commensurate with any increase in tankers visiting ports. Deep-draft visits to major ports are expected to increase as well, increasing the potential for an emergency need to anchor and creating navigational hazards for other vessels. Recreational and commercial fishing activity would likely stay largely the same related to this IPF.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in port usage by some fishing or recreational vessel operators.	Ports would need to perform maintenance and perform upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports, and to be able to host larger deep-draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, and changes in port usage by some fishing or recreational vessel operators.
Presence of structures: Allisions	An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. There are two types of allisions that occur: drift and powered. A drift allision generally occurs when a vessel is powered down due to operator choice or power failure. A powered allision generally occurs when an operator fails to adequately control their vessel movements or is distracted.	Although there are some exceptions (ferry traffic and cruise ships), BOEM expects vessel traffic to remain relatively steady into the reasonably foreseeable future (BOEM 2019:57). Vessel allisions with non-offshore-wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.
Presence of structures: Fish aggregation	Items in the water, such as ghost fishing gear, buoys, and energy platform foundations, can create an artificial reef effect, aggregating fish. Recreational and commercial fishing can occur near the artificial reefs. Recreational fishing is more popular than commercial near artificial reefs, as commercial mobile fishing gear can risk snagging on the artificial reef structure.	Fishing near artificial reefs is not expected to change meaningfully over the next 35 years.
Presence of structures: Habitat conversion	Equipment in the ocean can create a substrate for mollusks to attach to and fish eggs to settle near. This can create a reef-like habitat and benefit structure-oriented species on a constant basis.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Migration disturbances	Noise-producing activities, such as pile-driving and vessel traffic, may interfere with and adversely affect marine mammals during foraging, orientation, migration, response to predators, social interactions, or other activities. Marine mammals may also be sensitive to changes in magnetic field levels. The presence of structures and operational noise could cause mammals to avoid areas.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions. When multiple vessels need to navigate around a structure, then navigation is made more complex, as the vessels need to avoid both the structure and each other.	Although there are some exceptions (ferry traffic and cruise ships), BOEM expects vessel traffic to remain relatively steady into the reasonably foreseeable future (BOEM 2019:57). Even with increased port visits by deep-draft vessels, this is still a relatively small effect when considering the whole of Atlantic Coast vessel traffic. The presence of navigational hazards is expected to continue at or near current levels.
Presence of structures: Space-use conflicts	Currently, the offshore area is occupied by marine trade, stationary and mobile fishing, and survey activities.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Cable infrastructure	See “Anchoring” IPF.	See “Anchoring” IPF.
Cable emplacement/maintenance	Within the geographic analysis area for navigation and vessel traffic, existing cables may require access for maintenance activities. Infrequent cable maintenance activities may cause temporary increases in vessel traffic and navigational complexity.	Future new cables would cause temporary increases in vessel traffic during installation or maintenance, resulting in infrequent, localized, short-term impacts over the next 35 years. Care would need to be taken by vessels that are crossing the cable routes during these activities.
Traffic: Aircraft	USCG Search and Rescue (SAR) helicopters are the main aircraft that may be flying at low enough heights to risk interaction with WTGs. USCG SAR aircraft need to fly low enough that they can spot objects in the water.	SAR operations could be expected to increase with any increase in vessel traffic. However, as vessel traffic volume is not expected to increase appreciably, neither should SAR operations. Final PEIS Section 3.6.6 provides a discussion of navigation impacts on fishing vessel traffic.
Traffic: Vessels	See “Presence of structures: Navigation hazard” sub-IPF.	See “Presence of structures: Navigation hazard” sub-IPF.
Traffic: Vessels, collisions	See “Presence of structures: Navigation hazard” sub-IPF.	See “Presence of structures: Navigation hazard” sub-IPF.

Table D1-14. Summary of non-offshore-wind activities and the associated impact-producing factors for other uses: national security and military use

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Allisions	Existing stationary facilities that present allision risks include buoys used to mark inlet approaches, channels, shoals (NOAA 2021), dock facilities, meteorological buoys associated with offshore wind lease areas, and other offshore or shoreline-based structures.	No additional non-offshore-wind stationary structures were identified within the geographic analysis area. Stationary structures such as private or commercial docks may be added close to the shoreline.
Presence of structures: Fish aggregation	No existing stationary structures that would act as FADs were identified within the geographic analysis area.	No future non-offshore-wind additional stationary structures that would act as FADs were identified within the geographic analysis area.
Presence of structures: Navigation hazard	Existing stationary facilities within the geographic analysis area that present navigational hazards include buoys used to mark inlet approaches, channels, shoals (NOAA 2021), dock facilities, meteorological buoys associated with offshore wind lease areas, and other offshore or shoreline-based structures.	No future non-offshore-wind stationary structures were identified within the offshore geographic analysis area. Onshore development activities are anticipated to continue with additional proposed communication towers and onshore commercial, industrial, and residential developments.
Presence of structures: Space-use conflicts	Existing stationary facilities within the geographic analysis area that could present a space-use conflict include onshore wind turbines, communication towers, and other onshore commercial, industrial, and residential structures.	No future non-offshore-wind stationary structures were identified within the offshore geographic analysis area. Onshore development activities are anticipated to continue with additional proposed communication towers and onshore commercial, industrial, and residential developments.
Presence of structures: Cable infrastructure	Existing submarine cables cross cumulative lease areas.	Submarine cables would remain in current locations with infrequent maintenance continuing along those cable routes for the foreseeable future.
Traffic: Vessels	Current vessel traffic in the region is described in Final PEIS Section 3.6.6. Vessel activities associated with offshore wind in the cumulative lease areas are currently limited to site assessment surveys.	Continued vessel traffic in the region, as described in Final PEIS Section 3.6.6.
Traffic: Vessels, collisions	Current vessel traffic in the region is described in Final PEIS Section 3.6.6. Vessel activities associated with offshore wind in the cumulative lease areas are currently limited to site assessment surveys.	Continued vessel traffic in the region is described in Final PEIS Section 3.6.6.

FAD = fish aggregating device

Table D1-15. Summary of non-offshore-wind activities and the associated impact-producing factors for other uses: aviation and air traffic

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Towers	Existing aboveground stationary facilities within the geographic analysis area that present aviation hazards include onshore wind turbines, communication towers, dock facilities, and other onshore structures exceeding 200 feet (61 meters) in height.	No future non-offshore-wind stationary structures were identified within the offshore geographic analysis area. Onshore development activities are anticipated to continue with additional proposed communication towers.
Presence of structures: Space-use conflicts	Existing aboveground stationary facilities within the geographic analysis area that could cause space-use conflicts for aircraft include onshore wind turbines, communication towers, and other onshore structures exceeding 200 feet (61 meters) in height.	No future non-offshore-wind stationary structures were identified within the offshore geographic analysis area. Onshore development activities are anticipated to continue with additional proposed communication towers.

Table D1-16. Summary of non-offshore-wind activities and the associated impact-producing factors for other uses: cables and pipelines

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Allisions and navigation hazards	Structures within and near the geographic analysis area that pose potential allision hazards include buoys used to mark inlet approaches, channels, shoals, meteorological buoys associated with offshore wind lease areas, and shoreline developments such as docks, ports, and other commercial, industrial, and residential structures.	Reasonably foreseeable non-offshore-wind structures that could affect submarine cables have not been identified in the geographic analysis area.
Presence of structures: Space-use conflicts	Existing submarine cables cross cumulative lease areas and create potential space-use conflicts with marine mineral and sand borrow areas.	Reasonably foreseeable non-offshore-wind structures that could create space-use conflicts with submarine cables have not been identified in the geographic analysis area.
Presence of structures: Cable infrastructure	Existing submarine cables cross cumulative lease areas.	Reasonably foreseeable non-offshore-wind structures have not been identified in the geographic analysis area.

Table D1-17. Summary of non-offshore-wind activities and the associated impact-producing factors for other uses: marine minerals

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Space-use conflicts	Existing structures within the cumulative lease areas create potential space-use conflicts with marine mineral and sand borrow areas.	Reasonably foreseeable non-offshore-wind structures could have a small, long-term effect on marine mineral extraction.
Presence of structures: Cable infrastructure	Marine mineral extraction typically occurs within 8 miles of the shoreline, limiting adverse impacts on the offshore export cable routes.	Future cable installation would require consultation with the BOEM Marine Minerals Program.

Table D1-18. Summary of non-offshore-wind activities and the associated impact-producing factors for other uses: radar systems

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Towers	Wind developments in the direct line of sight with, or extremely close to, radar systems can cause clutter and interference. Existing wind developments in the area include the Jersey-Atlantic Wind Farm in Atlantic City, New Jersey.	Reasonably foreseeable non-offshore-wind structures proposed for construction in the offshore wind lease areas that could affect radar systems have not been identified.

Table D1-19. Summary of non-offshore-wind activities and the associated impact-producing factors for other uses: scientific research and surveys

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Navigation hazards	Stationary structures are limited in the open ocean environment of the geographic analysis area and include meteorological buoys associated with site assessment activities, the five Block Island Wind Farm WTGs, and the two Coastal Virginia Offshore Wind WTGs.	Reasonably foreseeable non-offshore-wind activities would not implement stationary structures within the open ocean environment that would pose navigational hazards and raise the risk of allisions for survey vessels and collisions for survey aircraft.

Table D1-20. Summary of non-offshore-wind activities and the associated impact-producing factors for recreation and tourism

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Anchoring	Anchoring occurs due to ongoing military, survey, commercial, and recreational activities.	Impacts from anchoring would continue and may increase due to offshore military operations, survey activities, commercial vessel traffic, and recreational vessel traffic. Modest growth in vessel traffic could increase the temporary, localized impacts of navigational hazards, increased turbidity levels, and potential for direct contact causing mortality of benthic resources.
Cable emplacement and maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be localized and limited to emplacement corridors.	Cable maintenance or replacement of existing cables in the geographic analysis area would occur infrequently and would generate short-term disturbances.
Lighting: Vessels	Ocean vessels have an array of lights including navigational lights and deck lights.	Anticipated modest growth in vessel traffic would result in some growth in the nighttime traffic of vessels with lighting.
Lighting: Structures	Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.
Cable emplacement/ maintenance	Existing cables may require access for maintenance activities. Infrequent cable maintenance activities may cause temporary increases in vessel traffic and navigational complexity for recreational vessels.	Future new cables would cause temporary increases in vessel traffic during installation or maintenance, resulting in infrequent, localized, short-term impacts over the next 35 years. Care would need to be taken by vessels that are crossing the cable routes during these activities.
Noise: Pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. These disturbances are temporary and localized and extend only a short distance beyond the work area.	No future activities were identified within the recreation and tourism geographic analysis area other than ongoing activities.
Noise: Cable laying/ trenching	Offshore trenching occurs periodically in connection with cable installation or sand and gravel mining.	No future activities were identified within the recreation and tourism geographic analysis area other than ongoing activities.
Noise: Vessels	Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.
Presence of structures: Allisions	An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. The likelihood of allisions is expected to continue at or near current levels.	Vessel allisions with non-offshore-wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures.	No future activities were identified within the recreation and tourism geographic analysis area other than ongoing activities.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented fishes are attracted to these locations. Recreational and commercial fishing can occur near these aggregation locations, although recreational fishing is more popular because commercial mobile fishing gear is more likely to snag on structures.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Habitat conversion	Structures, including foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented species thus benefit on a constant basis.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions, especially in nearshore areas. This navigation becomes more complex when multiple vessels must navigate around a structure, because vessels need to avoid both the structure and each other.	Vessel traffic, overall, is not expected to meaningfully increase over the next 35 years. The presence of navigational hazards is expected to continue at or near current levels.
Presence of structures: Space-use conflicts	Current structures do not result in space-use conflicts.	Reasonably foreseeable activities (non-offshore-wind) would not result in additional offshore structures.
Presence of structures: Viewshed	The only existing offshore structures within the viewshed of the projects are minor features such as buoys.	Non-offshore-wind structures that could be viewed in conjunction with the offshore components of the projects would be limited to meteorological towers. Marine activity would also occur within the marine viewshed.
Traffic: Vessels	Geographic analysis area ports and marine traffic related to shipping, fishing, and recreation are important to the region's economy. No substantial changes are anticipated to existing vessel traffic volumes.	New vessel traffic near the geographic analysis area would be generated by proposed barge routes and dredging demolition sites over the next 35 years. Marine commerce and related industries would continue to be important to the geographic analysis area economy.
Traffic: Vessel collisions	The region's substantial marine traffic may result in occasional vessel collisions, which would result in costs to the vessels involved. The likelihood of collisions is expected to continue at or near current rates.	An increased risk of collisions is not anticipated from future activities.

Table D1-21. Summary of non-offshore-wind activities and the associated impact-producing factors for sea turtles

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/fluids/hazmat	See Table D1-23 for a quantitative analysis of these risks. Ongoing releases are frequent and chronic. Sea turtle exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality (Shigenaka et al. 2021) or sublethal effects on individual fitness, including adrenal effects, dehydration, hematological effects, increased disease incidence, liver effects, poor body condition, skin effects, skeletomuscular effects, and several other health effects that can be attributed to oil exposure (Camacho et al. 2013; Bembenek-Bailey et al. 2019; Mitchelmore et al. 2017; Shigenaka et al. 2021; Vargo et al. 1986). Additionally, accidental releases may result in impacts on sea turtles due to effects on prey species (Table D1-10).	See Table D1-23 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Sea turtle exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality (Shigenaka et al. 2021; Wallace et al. 2010) or sublethal effects on individual fitness, including adrenal effects, dehydration, hematological effects, increased disease incidence, liver effects, poor body condition, skin effects, skeletomuscular effects, and several other health effects that can be attributed to oil exposure (Camacho et al. 2013; Bembenek-Bailey et al. 2019; Mitchelmore et al. 2017; Shigenaka et al. 2021; Vargo et al. 1986). Additionally, accidental releases may result in impacts on sea turtles due to effects on prey species (Table D1-10).
Accidental releases: Trash and debris	Trash and debris may be accidentally discharged through fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities, cables, lines, and pipeline laying, as well as debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low-quantity, localized, and low-impact events. Direct ingestion of plastic fragments is well documented and has been observed in all species of sea turtles (Bugoni et al. 2001; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). In addition to plastic debris, ingestion of tar, paper, Styrofoam™, wood, reed, feathers, hooks, lines, and net fragments has also been documented (Thomás et al. 2002). Ingestion can also occur when individuals mistake debris for potential prey items (Gregory 2009; Hoarau et al. 2014; Thomás et al. 2002). Potential ingestion of marine debris varies among species and life history stages due to differing feeding strategies (Nelms et al. 2016). Ingestion of plastics and other marine debris can result in both lethal and sublethal impacts on sea turtles, with sublethal effects more difficult to detect (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). Long-term sublethal effects may include dietary dilution, chemical contamination, depressed immune system function, poor body condition, and reduced growth rates, fecundity, and reproductive success. However, these effects are cryptic and clear causal links are difficult to identify (Nelms et al. 2016).	Trash and debris may be accidentally discharged through fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities and cables, lines and pipeline laying, and debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low-quantity, localized, and low-impact events. Direct and indirect ingestion of plastic fragments and other marine debris is well documented and has been observed in all species of sea turtles (Bugoni et al. 2001; Gregory 2009; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014; Thomás et al. 2002). Ingestion can result in both lethal and sublethal impacts on sea turtles, with sublethal effects more difficult to detect (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). However, these effects are cryptic and clear causal links are difficult to identify (Nelms et al. 2016).
Cable emplacement and maintenance	Cable maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances will be localized and generally limited to the emplacement corridor. Data are not available regarding effects of suspended sediments on adult and juvenile sea turtles, although elevated suspended sediments may cause individuals to alter normal movements and behaviors. However, these changes are expected to be too small to be detected (NOAA 2020). Sea turtles would be expected to swim away from the sediment plume. Elevated turbidity is most likely to affect sea turtles if a plume causes a barrier to normal behaviors, but no impacts would be expected due to swimming through the plume (NOAA 2020). Turbidity associated with increased sedimentation may result in short-term, temporary impacts on sea turtle prey species (Table D1-10).	The impact on water quality from accidental sediment suspension during cable emplacement is short term and temporary. If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any impacts would be short term and temporary. Turbidity associated with increased sedimentation may result in short-term, temporary impacts on some sea turtle prey species (Table D1-10).
Electric and magnetic fields and cable heat	EMFs emanate constantly from installed telecommunication and electrical power transmission cables. Sea turtles appear to have a detection threshold of magnetosensitivity and behavioral responses to field intensities ranging from 0.0047 to 4000 µT for loggerhead turtles, and 29.3 to 200 µT for green turtles, with other species likely similar due to anatomical, behavioral, and life history similarities (Normandeau et al. 2011). Juvenile or adult sea	During operations, future new cables would produce EMF. Submarine power cables in the geographic analysis area for sea turtles are assumed to be installed with appropriate shielding and burial depth to reduce potential EMF to low levels (MMS 2007: Section 5.2.7). EMF of any two sources would not overlap. Although the EMF would exist as long as a cable was in operation, impacts, if any, would likely be difficult to detect, if they occur at all.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
	turtles foraging on benthic organisms may be able to detect magnetic fields while they are foraging on the bottom near the cables and up to potentially 82 feet (25 meters) in the water column above the cable. Juvenile and adult sea turtles may detect the EMF over relatively small areas near cables (e.g., when resting on the bottom or foraging on benthic organisms near cables or concrete mattresses). There are no data on impacts on sea turtles from EMFs generated by underwater cables, although anthropogenic magnetic fields can influence migratory deviations (Luschi et al. 2007; Snoek et al. 2016; 2020). However, any potential impacts from AC cables on turtle navigation or orientation would likely be undetectable under natural conditions, and thus would be insignificant (Normandeau et al. 2011).	Furthermore, this IPF would be limited to extremely small portions of the areas used by resident or migrating sea turtles. As such, exposure to this IPF would be low and impacts on sea turtles would not be expected.
Lighting: Vessels	Ocean vessels such as ongoing commercial vessel traffic, recreational and fishing activity, and scientific and academic research traffic have an array of lights including navigational, deck lights, and interior lights. Such lights have some limited potential to attract sea turtles although the impacts, if any, are expected to be localized and temporary.	Construction, operations, and decommissioning vessels associated with non-offshore-wind activities produce temporary and localized light sources that could result in attraction or avoidance behavior of sea turtles. These short-term impacts are expected to be of low intensity and occur infrequently.
Lighting: Structures	Artificial lighting on nesting beaches or in nearshore habitats has the potential to result in disorientation to nesting females and hatchling turtles. Artificial lighting on the OCS does not appear to have the same potential for effects. Decades of oil and gas platform operation in the Gulf of Mexico, which can have considerably more lighting than offshore WTGs, has not resulted in any known impacts on sea turtles (BOEM 2019).	Non-offshore-wind activities would not be expected to appreciably contribute to this sub-IPF. As such, no impact on sea turtles would be expected.
Noise: G&G	Infrequent site characterization surveys and scientific surveys produce high-intensity, impulsive noise around sites of investigation. These activities have the potential to result in some impacts including potential auditory injuries, short-term disturbance, behavioral responses, and short-term displacement of feeding or migrating sea turtles if present within the ensonified area (NSF and USGS 2011). The potential for PTS and TTS is considered possible in proximity to G&G surveys utilizing air guns, but impacts are unlikely, as turtles would be expected to avoid such exposure and survey vessels would pass quickly (NSF and USGS 2011). No significant impacts would be expected at the population level.	Same as ongoing activities, with the addition of possible future oil and gas exploration surveys.
Noise: Impact and vibratory pile-driving	Noise from pile-driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water or through the seabed can result in high-intensity, low-exposure-level, and long-term but localized intermittent risk to sea turtles. Impacts, potentially including behavioral responses, masking, TTS, and PTS, would be localized in nearshore waters. Data regarding threshold levels for impacts on sea turtles from sound exposure during pile-driving are very limited, and no regulatory threshold criteria have been established for sea turtles. Based on current literature, the following thresholds are used to assess impacts on turtles: • Potential mortal injury: SEL_{24h} 210 dB re 1 μPa^2 s or greater than Lpk 207 dB re 1 μPa (Popper et al. 2014) • PTS: SEL_{24h} 204 dB re 1 μPa^2 s, Lpk 232 dB re 1 μPa (Finneran et al. 2017) • TTS: SEL_{24h} 189 dB re 1 μPa^2 s, Lpk 226 dB re 1 μPa (Finneran et al. 2017) • Behavioral harassment: SPL 175 dB re 1 μPa (Finneran et al. 2017)	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.
Noise: Vessels	The frequency range for vessel noise (10 to 1000 Hz) (MMS 2007) overlaps with sea turtles' known hearing range (less than 1,000 Hz with maximum sensitivity between 200 to 700 Hz) (Bartol 1994) and would therefore be audible. However, Hazel et al. (2007) suggest that sea turtles' ability to detect approaching vessels is primarily vision-dependent, not acoustic. Sea turtles may respond to vessel approach or noise with a startle response (diving or swimming away) and a temporary stress response (NSF and USGS 2011). Samuel et al. (2005) indicated that vessel noise could have an effect on sea turtle behavior, especially their submergence patterns.	Any offshore projects that require the use of ocean vessels could potentially result in long-term but infrequent impacts on sea turtles, including temporary startle responses, masking of biologically relevant sounds, physiological stress, and behavioral changes, especially their submergence patterns (NSF and USGS 2011; Samuel et al. 2005). However, BOEM expects that these brief responses of individuals to passing vessels would be unlikely given the patchy distribution of sea turtles, and no stock or population-level effects would be expected.
Noise: Drilling	Noise from drilling prior to pile-driving could occur in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Drilling activities used prior to pile-driving activities to remove soil or boulders from inside the piles in cases of pile refusal may produce SPL of 140 dB re μPa at 3,280 ft (Austin et al. 2018). This would exceed the continuous noise threshold of 120 dB re 1 μPa (Table 3.7-3) beyond 3,000 ft, but these events are expected to be short term, which limits the sea turtles potentially present during construction. While behavioral responses may occur from drilling, they are not expected to be long lasting or biologically significant to sea turtle populations.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.
Noise: Aircraft	Aircraft routinely travel in the geographic analysis area for sea turtles. With the possible exception of rescue operations, no ongoing aircraft flights would occur at altitudes that would elicit a response from sea turtles. If flights are at a sufficiently low altitude, sea turtles may respond with a startle response (diving or swimming	Future low-altitude aircraft activities such as survey activities and navy training operations could result in short-term responses of sea turtles to aircraft noise. If flights are at a sufficiently low altitude, sea turtles may respond with a startle response (diving or swimming away), altered submergence patterns, and a temporary stress

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
	away), altered submergence patterns, and a temporary stress response (NSF and USGS 2011; Samuel et al. 2005). These brief responses would be expected to dissipate once the aircraft has left the area.	response (NSF and USGS 2011; Samuel et al. 2005). These brief responses would be expected to dissipate once the aircraft has left the area.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also undergoing continual upgrades and maintenance. Port expansion activities are localized to nearshore habitats and are expected to result in short-term, temporary impacts, if any, on sea turtles. Vessel noise may affect sea turtles, but response would be expected to be short term and temporary (see the Vessels: Noise sub-IPF above). The impacts on water quality from sediment suspension during port expansion activities are short term and temporary, and would be similar to those described under the Cable emplacement/maintenance IPF above.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. In addition, the general trend along the coastal region from Virginia to Maine is that port activity will increase modestly. The ability of ports to receive the increase in larger ships will require port modifications. Future channel-deepening activities are being undertaken to accommodate deeper-draft vessels for the Panama Canal Locks. The additional traffic and larger vessels could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. The increased sediment suspension could be long term depending on the vessel traffic increase. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and may continue to increase in the foreseeable future. Additional impacts associated with the increased risk of vessel strikes could also occur (see the Traffic: Vessel collisions sub-IPF below).
Presence of structures: Entanglement or ingestion of lost fishing gear	The Mid-Atlantic region has more than 130 artificial reefs. Currently, bridge foundations and the Block Island Wind Farm may be considered artificial reefs and may have higher levels of recreational fishing, which increases the chances of sea turtles encountering lost fishing gear, resulting in possible ingestions, entanglement, injury, or death of individuals (Berreiros and Raykov 2014; Gregory 2009; Vegter et al. 2014) if present where these structures are located. At the scale of the OCS geographic analysis area for sea turtles, there are very few areas that would serve to concentrate recreational fishing and increase the likelihood that sea turtles would encounter lost fishing gear.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.
Presence of structures: Habitat conversion and prey aggregation	The Mid-Atlantic region has more than 130 artificial reefs. Hard-bottom (scour control and rock mattresses) and vertical structures (bridge foundations, Block Island Wind Farm WTGs, and two WTGs with the Coastal Virginia Offshore Wind pilot project) in a soft-bottom habitat can create artificial reefs, thus inducing the reef effect (Taormina et al. 2018; NMFS 2015). The reef effect is usually considered a beneficial impact associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for sea turtles compared to the surrounding soft bottoms.	The presence of structures associated with non-offshore-wind development in nearshore coastal waters has the potential to provide habitat for sea turtles as well as preferred prey species. This reef effect has the potential to result in long-term, low-intensity, beneficial impacts. Bridge foundations will continue to provide foraging opportunities for sea turtles with measurable benefits to some individuals.
Presence of structures: Avoidance/displacement	No ongoing activities in the geographic analysis area for sea turtles beyond offshore wind facilities are measurably contributing to this sub-IPF. There may be some impacts resulting from the existing Block Island Wind Farm (five WTGs) and Coastal Virginia Offshore Wind pilot project (two WTGs) but, given the limited number of WTGs, no measurable impacts are occurring.	Not contemplated for non-offshore-wind facility sources.
Presence of structures: Behavioral disruption — breeding and migration	No ongoing activities in the geographic analysis area for sea turtles beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non-offshore-wind facility sources.
Presence of structures: Displacement into higher risk areas (vessels and fishing)	No ongoing activities in the geographic analysis area for sea turtles beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non-offshore-wind facility sources.
Traffic: Vessel collisions	Current activities contributing to this sub-IPF include port traffic levels, fairways, TSS, commercial vessel traffic, recreational and fishing activity, and scientific and academic vessel traffic. Propeller and collision injuries from boats and ships are common in sea turtles. Vessel strike is an increasing concern for sea turtles, especially in the southeastern United States where development along the coasts is likely to result in increased recreational boat traffic. In the United States, the percentage of strandings of loggerhead sea turtles attributed to vessel strikes increased from approximately 10% in the 1980s to a record high of 20.5% in 2004 (NMFS and USFWS 2007). Sea turtles are most susceptible to vessel collisions in coastal waters, where they forage from May through November. Vessel speed may exceed 10 knots in such waters, and evidence suggests that they cannot reliably avoid being struck by vessels exceeding 2 knots (Hazel et al. 2007).	Vessel traffic associated with non-offshore-wind development has the potential to result in an increased collision risk. While these impacts would be of high consequence, the patchy distribution of sea turtles makes stock or population-level effects unlikely (Navy 2018).
Gear utilization	A primary threat to sea turtles is their unintended capture in fishing gear, which can result in drowning or cause injuries that lead to mortality (e.g., swallowing hooks). For example, trawl fishing is among the greatest continuing primary threats to the loggerhead turtle (NMFS and USFWS 2019), and sea turtles are also caught as bycatch in other fishing gear, including longlines, gillnets, hook and line, pound nets, pot/traps, and dredge fisheries. A	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
	substantial impact of commercial fishing on sea turtles is the entrapment or entanglement that occurs with a variety of fishing gear.	

µPa = micropascal; µT = microtesla; AC = alternating current; L_{pk} = peak sound pressure level in units of decibels referenced to 1 micropascal; SEL_{24h} = sound exposure level over 24 hours (in units of decibels referenced to 1 micropascal squared second).

Table D1-22. Summary of non-offshore-wind activities and the associated impact-producing factors for scenic and visual resources

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases	Ongoing offshore and onshore construction projects involve the use of vehicles, vessels, and equipment that contain fuel, fluids, and hazmat that have the potential for accidental release. Offshore and onshore construction can also result in sedimentation from land and seabed disturbance and accidental releases of trash and debris with associated visual impacts.	Planned offshore and onshore construction projects have the potential to result in accidental releases from vehicles, vessels, and equipment that contain fuel, fluids, and hazmat. Future offshore and onshore construction could also result in sedimentation from land and seabed disturbance and accidental releases of trash and debris with associated visual impacts.
Land disturbance	Onshore human-caused and naturally occurring erosion and sedimentation results from construction, maintenance, and weather events.	Ongoing onshore construction projects could generate noticeable disturbance in the landscape. Intensity and extent would vary depending on the location, type, and duration of activities.
Lighting	Offshore vessels have an array of lights including navigational lights, deck lights, and interior lights. Various ongoing onshore and coastal construction projects have nighttime activities, as well as existing structures, facilities, and vehicles that would require nighttime lighting.	Ongoing onshore construction projects involving nighttime activity could generate nighttime lighting. Intensity and extent would vary depending on the location, type, direction, and duration of nighttime lighting.
Presence of structures	Buoys are the only existing stationary structures within the offshore viewshed of the projects. Typically, buoys are visible only in the immediate foreground (less than 1 mile). Stationary and moving barges, boats, and ships also are visible in the daytime and nighttime viewsheds.	Onshore wind-related structures that could be viewed in conjunction with the offshore project components would be limited to meteorological towers, substations, and electrical transmission towers and conductors.
Traffic	Ongoing activities contribute air, marine, and onshore traffic and visible congestion.	Planned onshore and offshore construction projects involving vessel, vehicle, and helicopter traffic could generate noticeable changes in the characteristic seascape and landscape and viewer experience. Intensity and extent of the changes would vary depending on the location, type, direction, and duration of the traffic.

Table D1-23. Summary of non-offshore-wind activities and the associated impact-producing factors for water quality

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/ fluids/hazmat	Accidental releases of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable lines and pipeline-laying activities. According to the U.S. Department of Energy, 31,000 barrels of petroleum are spilled into U.S. waters from vessels and pipelines in a typical year. Approximately 40.5 million barrels of oil were lost as a result of tanker incidents from 1970 to 2009, according to International Tanker Owners Pollution Federation Limited, which collects data on oil spills from tankers and other sources. From 1990 to 1999, the average annual input to the coastal Northeast was 220,000 barrels of petroleum and into the offshore was fewer than 70,000 barrels. Impacts on water quality would be expected to brief and localized from accidental releases.	Future accidental releases from offshore vessel usage, spills, and consumption will likely continue on a similar trend. Impacts are unlikely to affect water quality.
Accidental releases: Trash and debris	Trash and debris may be accidentally discharged through fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities, and cables, lines, and pipeline laying. Accidental releases of trash and debris are expected to be low-probability events. BOEM assumes operator compliance with federal and international requirements for management of shipboard trash; such events also have a relatively limited spatial impact.	As population and vessel traffic increase gradually over the next 35 years, accidental release of trash and debris may increase. However, there does not appear to be evidence that the volumes and extents anticipated would have any effect on water quality.
Anchoring	Impacts from anchoring occur due to ongoing military use and survey, commercial, and recreational activities.	Impacts from anchoring may occur semi-regularly over the next 35 years due to offshore military operations or survey activities. These impacts would include increased seabed disturbance, resulting in increased turbidity levels. All impacts would be localized, short term, and temporary.
Cable emplacement and maintenance	Elevated suspended sediment concentrations can occur under natural tidal conditions and increase during storms, trawling, and vessel propulsion. Survey activities and new cable- and pipeline-laying activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances would be short term and either limited to the emplacement corridor or localized.	Suspension of sediments may continue to occur infrequently over the next 35 years due to survey activities and submarine cable, lines, and pipeline-laying activities. Future new cables would occasionally disturb the seafloor and cause short-term increases in turbidity and minor alterations in localized currents, resulting in localized, short-term impacts. If the cable routes enter the water quality geographic analysis area, short-term disturbance in the form of increased suspended sediment and turbidity would be expected.

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Port utilization: Expansion	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. In addition, the general trend along the coastal region from Virginia to Maine is that port activity will increase modestly. The ability of ports to receive the increase in larger ships will require port modifications, which, along with additional vessel traffic, could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. The increased sediment suspension could be long-term depending on the vessel traffic increase. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and may continue to increase in the foreseeable future.	The general trend along the coastal region from Virginia to Maine is that port activity will increase modestly over the next 35 years. Port modifications and channel-deepening activities are being undertaken to accommodate the increase in vessel traffic and deeper-draft vessels that transit the Panama Canal Locks. The additional traffic and larger vessels could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and may continue to increase in the foreseeable future.
Presence of structures	The installation of onshore and offshore structures leads to alteration of local water currents. These disturbances would be localized but, depending on the hydrologic conditions, have the potential to affect water quality through the formation of sediment plumes.	Impacts associated with the presence of structures include temporary sediment disturbance during maintenance. This sediment suspension would lead to interim and localized impacts.
Discharges/intakes	Discharges affect water quality by introducing nutrients, chemicals, and sediments to the water. There are regulatory requirements related to prevention and control of discharges, accidental spills, and nonindigenous species.	Increased coastal development is causing increased nutrient pollution in communities. In addition, ocean disposal activity in the North and Mid-Atlantic is expected to gradually decrease or remain stable. Impacts of ocean disposal on water quality are minimized because USEPA has established dredge spoil criteria and regulates the disposal permits issued by USACE. The impact on water quality from sediment suspension during these future activities would be short term and localized.
Land disturbance: Erosion and sedimentation	Ground-disturbing activities may lead to unvegetated or otherwise unstable soils. Precipitation events could potentially mobilize the soils into nearby surface waters, leading to potential erosion and sedimentation effects and subsequent increased turbidity.	Ground disturbance associated with construction and installation of onshore components could lead to unvegetated or unstable soils. Precipitation events could mobilize these soils, leading to erosion and sedimentation effects and turbidity. The impacts would be short term and localized with an increased likelihood of impacts limited to onshore construction periods.
Land disturbance: Onshore construction	Onshore construction activities may lead to unvegetated or otherwise unstable soils as well as soil contamination due to leaks or spills from construction equipment. Precipitation events could potentially mobilize the soils into nearby surface waters, leading to increased turbidity and alteration of water quality.	The general trend along coastal regions is that port activity will increase modestly in the future. This increase in activity includes expansion needed to meet commercial, industrial, and recreational demand. Modifications to cargo-handling equipment and conversion of some undeveloped land to meet port demand would be required to receive the increase in larger ships.

hazmat = hazardous materials

Table D1-24. Summary of non-offshore-wind activities and the associated impact-producing factors for wetlands

Associated IPFs: Sub-IPFs	Ongoing Activities	Planned Activities Intensity/Extent
Accidental releases: Fuel/oil	Onshore construction activities are a potential source of wetland water contamination from heavy equipment oil leaks or accidental spills. Precipitation events could potentially mobilize the soils into nearby wetlands, leading to alteration of water quality.	Onshore construction activities would require heavy equipment use and HDD activities, and potential spills could occur because of an inadvertent release from the machinery or during refueling activities. Applicants would develop and implement a Spill Prevention, Control, and Countermeasure Plan to minimize impacts on water quality (prepared in accordance with applicable NJDEP and NYSDEC regulations). Minor and short-term impacts are unlikely to affect wetland water quality.
Land disturbance: Erosion and sedimentation	Ground disturbance activities may lead to unvegetated or otherwise unstable soils. Precipitation events could potentially mobilize the soils into nearby wetlands, leading to potential erosion and sedimentation effects and subsequent increased turbidity.	Ground disturbance associated with construction and installation of onshore components could lead to unvegetated or unstable soils. Precipitation events could mobilize these soils, leading to erosion and sedimentation effects and turbidity. The impacts would be short term and localized, with an increased likelihood of impacts limited to onshore construction periods.
Land disturbance: Onshore construction	Onshore construction activities may lead to unvegetated or otherwise unstable soils as well as soil contamination due to leaks or spills from construction equipment. Precipitation events could potentially mobilize the soils into nearby wetlands, leading to increased turbidity and alteration of water quality.	The general trend along coastal regions are that port activity and land development will increase modestly in the future. This increase in activity includes expansion needed to meet commercial, industrial, and recreational demand. Modifications to cargo-handling equipment and conversion of some undeveloped land to meet port demand would be required to receive the increase in larger ships.

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Attachment D2: Maximum-Case Scenario Estimates for Offshore Wind Projects

The following tables provide maximum-case scenario estimates of potential offshore wind project impacts assuming maximum buildout within the NY Bight PEIS geographic analysis areas. BOEM developed these estimates based on offshore wind demand, as discussed in its 2019 study *National Environmental Policy Act Documentation for Impact-Producing Factors in the Offshore Wind Cumulative Impacts Scenario on the North Atlantic Outer Continental Shelf* (BOEM 2019). Estimates disclosed in the Final PEIS's Chapter 3, No Action Alternative analyses were developed by summing acreage or number calculations across all lease areas noted as occurring within, or overlapping, a given geographic analysis area. This likely overestimates some impacts in cases where lease areas only partially overlap analysis areas. However, this approach was used to provide the most conservative estimate of planned offshore wind development.

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Table D2-1. Offshore wind development activities on the U.S. East Coast: projects and assumptions (part 1, turbine and cable design parameters) August 2024

Region	Lease, Project, Lease Remainder[1]	Status	Geographic Analysis Area (X denotes lease area is within or overlaps geographic analysis area)[3]								Estimated Construction Schedule[4]	Turbine Number[5]	Generating Capacity (MW)	Offshore Export Cable Length (statute miles)[6]	Offshore Export Cable Installation Tool Disturbance Width (feet)	Interarray Cable Length (statute miles)[7]	Hub Height (feet)[8]	Rotor Diameter (feet)[8]	Height of Turbine (feet)[8]
			Air Quality and GHG Emissions, Water Quality, Navigation and Vessel Traffic	Benthic Resources	Birds, Bats, Marine Mammals, Sea Turtles, Finfish, Invertebrates, EFH, Fisheries, Research Surveys	Coastal Habitat and Fauna	Demographics, Employment, and Economics; Environmental Justice	Cultural Resources	Other Marine Uses (excluding research surveys & navigation)	Scenic and Visual Resources, Recreation & Tourism									
ME	Aqua Ventus (Maine state waters)	State Project			X						2025	2	11					450	520
	Total Other State Waters											**2**	**11**						
EXISTING AND ONGOING PROJECTS																			
MA/RI	Block Island (state waters)	Built			X						Built	5	30	28	5	2	328	541	659
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP Approved (ROD issued 2021)			X						2024-2025	62	800	98	6.5	171	451	721	812
MA/RI	South Fork Wind, OCS-A 0517	Built			X						Built	12	132	139	6.5	24	358	543	614
VA/NC	CVOW Pilot, OCS-A 0497	Built			X						Built	2	12	27	3.3	9	364	506	620
MA/RI	Revolution Wind, part of OCS-A 0486	COP Approved (ROD issued 2023)			X						2024–2025	65	704	84	6.5	155	512	722	853
NY/NJ	Ocean Wind 1, OCS-A 0498	COP Approved (ROD issued 2023), PPA, SAP	X	X	X	X	X	X	X	X	By 2030, spread over 2026–2030	98	1,100	194	7	190	512	788	906
MA/RI	Sunrise Wind, OCS-A 0487	COP Approved (ROD issued 2024)			X						2024–2025	94	934	104.6	13	180	459	656	787
MA/RI	New England Wind, OCS-A 0534, and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])	OP Approved (ROD issued 2024)			X						2025	63	804	125	10	139	702	935	1,171
MA/RI	New England Wind, OCS-A 0534, and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])	OP Approved (ROD issued 2024)			X						2025 or later	65	1,725	226	10	201	702	935	1,171
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X	X	X	X	X	X	X	X	2024–2026	54	816	46	5	133	525	853	951
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X	X	X	X	X	X	X	X	By 2030, spread over 2026–2030	84	1,260	30	5	166	525	853	951
VA/NC	CVOW-C, OCS-A 0483	COP Approved (ROD issued 2023), SAP			X						2023–2024	176	2,587	338	16.4	300	489	761	869
	Total Existing and Ongoing Projects											**780**	**1976**	**1439.6**		**1670**			
PLANNED PROJECTS																			
Massachusetts/Rhode Island Region																			
MA/RI	SouthCoast Wind, OCS-A 0521	COP			X						2025	147	2,400	1,179	6.5	497	605	919	1,066
MA/RI	Beacon Wind, part of OCS-A 0520 (Phase 1)	COP			X						2026–2029	77	1,230	202	6.5	187	591	984	1,083

Region	Lease, Project, Lease Remainder[1]	Status	Geographic Analysis Area (X denotes lease area is within or overlaps geographic analysis area)[3]								Estimated Construction Schedule[4]	Turbine Number[5]	Generating Capacity (MW)	Offshore Export Cable Length (statute miles)[6]	Offshore Export Cable Installation Tool Disturbance Width (feet)	Interarray Cable Length (statute miles)[7]	Hub Height (feet)[8]	Rotor Diameter (feet)[8]	Height of Turbine (feet)[8]
			Air Quality and GHG Emissions, Water Quality, Navigation and Vessel Traffic	Benthic Resources	Birds, Bats, Marine Mammals, Sea Turtles, Finfish, Invertebrates, EFH, Fisheries, Research Surveys	Coastal Habitat and Fauna	Demographics, Employment, and Economics; Environmental Justice	Cultural Resources	Other Marine Uses (excluding research surveys & navigation)	Scenic and Visual Resources, Recreation & Tourism									
MA/RI	Beacon Wind, part of OCS-A 0520 (Phase 2)	COP			X						2027–2030	78	1,100	202	6.5	187	591	984	1,083
MA/RI	Bay State Wind, part of OCS-A 0500	Planning			X						By 2030, spread over 2026–2030	94	1,128	139	6.5	148	492	722	853
MA/RI	OCS-A 0500 remainder	Planning			X						By 2030, spread over 2026–2030	116	1,392	200	7	240	492	722	853
MA/RI	OCS-A 0487 remainder	Planning			X						By 2030, spread over 2026–2030			200	7		492	722	853
MA/RI	Vineyard Northeast Wind OCS-A 0522	COP			X						2027–2030	160	2,400	532	33	221	787	1,050	1,312
	Total MA/RI Leases[2]											**672**	**9,650**	**2,654**		**1,480**			
New York/New Jersey Region																			
NY/NJ	Atlantic Shores South, OCS-A 0499[10]	COP Approved (ROD issued 2024)	X	X	X	X	X	X	X	X	2025–2028	195	2,837	441	3.3	547	576	919	1,049
NY/NJ	Atlantic Shores North, OCS-A 0549	COP	X	X	X	X	X	X	X	X	2029-2032	157	2,400	528	3.3	446	576	968	1,049
NY/NJ	Ocean Wind 2, part of OCS- A 0532	Planning	X	X	X	X	X	X	X	X	By 2030, spread over 2026-2030	109	1,148	200	7	173	512	788	906
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	X	X	X	X	X	X	X	Start between 2026 and 2030 (construction may extend beyond 2030)	1,103[11]	NA	1,772[12]	131[13]	1,582[14]	NA	1,214[15]	1,312[16]
	Total NY/NJ Leases											**1,564**	**6,385**	**2,941**		**2,748**			
Maryland/Delaware Region																			
DE/MD	Skipjack, part of OCS-A 0519	COP			X						By 2030, spread over 2026–2030	16	192	40	6.5	23.7	492	722	822
DE/MD	US Wind/Maryland Offshore Wind Project, part of OCS-A 0490	COP			X						2025	121	2,000	145	6.5	152	528	820	938
DE/MD	GSOE I, OCS-A 0482	Planning	X		X						By 2030	94	1,128	200	6.5	139.12	492	722	853
DE/MD	OCS-A 0519 remainder	Planning			X						By 2030 or later		1,128	200	6.5	139.12	492	722	853
	Total DE/MD Leases											**231**	**4,448**	**585**		**453.94**			

Region	Lease, Project, Lease Remainder[1]	Status	Geographic Analysis Area (X denotes lease area is within or overlaps geographic analysis area)[3]								Estimated Construction Schedule[4]	Turbine Number[5]	Generating Capacity (MW)	Offshore Export Cable Length (statute miles)[6]	Offshore Export Cable Installation Tool Disturbance Width (feet)	Interarray Cable Length (statute miles)[7]	Hub Height (feet)[8]	Rotor Diameter (feet)[8]	Height of Turbine (feet)[8]
			Air Quality and GHG Emissions, Water Quality, Navigation and Vessel Traffic	Benthic Resources	Birds, Bats, Marine Mammals, Sea Turtles, Finfish, Invertebrates, EFH, Fisheries, Research Surveys	Coastal Habitat and Fauna	Demographics, Employment, and Economics; Environmental Justice	Cultural Resources	Other Marine Uses (excluding research surveys & navigation)	Scenic and Visual Resources, Recreation & Tourism									
Virginia/North Carolina/South Carolina Region																			
VA/NC	Kitty Hawk North, OCS-A 0508	COP			X						By 2030, spread over 2026–2030	69	1,242	112	30	149	574	935	1,042
VA/NC	Kitty Hawk Wind South, OCS-A 0508	COP			X						By 2030, spread over 2026–2030	121	2,178	353	30	200	574	935	1,042
SC	TotalEnergies Renewables Wind, OCS-A 0545	Planning			X						By 2030, spread over 2026–2030	64	785	200	6.5	94.7	492	722	853
SC	Duke Energy Renewables Wind, OCS-A 0546	Planning			X						By 2030, spread over 2026–2030	64	788	200	6.5	94.7	492	722	853
	Total VA/NC/SC Leases											**318**	**4,993**	**865**		**538.4**			
	OCS Total (PLANNED)[9]											**2,785**	**25,476**	**7,045**		**5,220**			
	OCS Total[9]											**3,565**	**27,463**	**8,485**		**6,890**			

[1] The spacing/layout for projects are as follows: NE State water projects include a single strand of WTGs and no OSS. For projects in the RI, MA, NY, NJ, DE, and MD lease areas, a 1×1–nm grid spacing is assumed. For the CVOW Project, the spacing is 0.7 nm; and the Dominion commercial lease area off the coast of Virginia would utilize 0.5 nm average spacing, which is less than the 1×1–nm spacing due to the need to attain the state's goals.
[2] Because development could occur anywhere within the RI and MA lease areas and assumes a continuous 1x1–nm grid, the actual development for these projects is expected to be approximately 73% of the collective technical capacity. Under the scenario described in this appendix, the total area in the RI and MA lease areas is greater than the area needed to meet state demand. Therefore, if a project is not constructed, BOEM assumes that another future project would be constructed to fulfill the unmet demand.
[3] This column identifies lease areas that are applicable to each resource based on the geographic analysis areas.
[4] The estimated construction schedule is based on information known at the time of this analysis and could be different when an applicant submits a COP.
[5] The number of turbines for those lease areas without an announced number of turbines has been calculated based on lease size, a 1×1-nm grid spacing, or the generating capacity.
[6] BOEM assumes that each offshore wind development would have its own cable (both onshore and offshore) and that future projects would not utilize a regional transmission line. The length of offshore export cable for those lease areas without a known project size is assumed to include two offshore cables totaling 120 miles (193 kilometers). The offshore export cable would be buried a minimum of 4 feet (1.8 meters) but not more than 10 feet (3.1 meters).
[7] If information for a future project could not be obtained from a COP, the length of interarray cabling is assumed to be the average amount per foundation based on the COPs submitted to date, which is 1.48 miles (2.4 kilometers). In addition, for those lease areas that require more than one OSS, it is assumed that an additional 6.2 miles (9.9 kilometers) of interlink cable would be required to link the two OSSs. Interarray cable is assumed to be buried between 4 and 6 feet (1.2 and 1.8 meters).
[8] The hub height, rotor diameter, and turbine height for lease areas is based on worst-case scenario for the resource area. Presentation of heights vary by COP and may be presented relative to MLLW, mean sea level, or height above highest astronomical tide.
[9] BOEM recognizes that the estimates presented within this analysis are likely high, conservative estimates; however, BOEM believes that this analysis is appropriately capturing the potential cumulative impacts and errs on the side of maximum impacts. Totals by lease area and by OCS may not fully sum due to rounding errors.
[10] Atlantic Shores South consists of two energy facilities (Project 1 and Project 2). Project 1 would have a capacity of 1,510 MW; Project 2's capacity is not yet determined, but Atlantic Shores has a goal of 1,327 MW.
[11] Total turbines across all six NY Bight lease areas provided by the lessees. These are estimates used for analysis purposes only and do not reflect the actual number of turbines that may be constructed in each NY Bight lease area.
[12] Total export cable length is the anticipated total across all six NY Bight lease areas as calculated by BOEM based upon information provided by the lessees.
[13] Cable disturbance width based on max value of the RPDE.
[14] Total interarray cable length is the anticipated total across all six NY Bight lease areas provided by the lessees.
[15] Rotor diameter based on max value of the RPDE.
[16] Height of turbine based on max value of the RPDE.
CT = Connecticut; CVOW = Coastal Virginia Offshore Wind; DE = Delaware; FDR = Facility Design Report; FIR = Fabrication and Installation Report; GSOE = Garden State Offshore Energy; MA = Massachusetts; MD = Maryland; NA = not applicable; NC = North Carolina; NE = New England; NJ = New Jersey; NY = New York; PPA = Power Purchase Agreement; RAP = research activities plan; RI = Rhode Island; SAP = site assessment plan; SC = South Carolina; VA = Virginia

Table D2-2. Offshore wind development activities on the U.S. East Coast: projects and assumptions (part 2, seabed/anchoring disturbance and scour protection) August 2024[1]

Region	Lease/Project/Lease Remainder	Status	Geographic Analysis Area (X denotes lease area is within or overlaps analysis area)[2]								Estimated Foundation Number[3]	Foundation Footprint[3] (acres)[3]	WTG Seabed Disturbance (Foundation + Scour Protection) (acres)[4]	Offshore Export Cable Seabed Disturbance (acres)[5]	Offshore Export Cable Operating Seabed Footprint (acres)[6]	Offshore Export Cable Hard Protection (acres)[7]	Anchoring Disturbance (acres)[8]	Interarray Construction Footprint/Seabed Disturbance (acres)[9]	Interarray Operating Footprint/ Seabed Disturbance (acres)[10]	Interarray Cable Hard Protection (acres)[11]
			Air Quality and GHG Emissions, Water Quality, Navigation and Vessel Traffic	Benthic Resources	Birds, Bats, Marine Mammals, Sea Turtles, Finfish, Invertebrates, EFH, Fisheries, Research Surveys	Coastal Habitat and Fauna	Demographics, Employment, and Economics; Environmental Justice	Cultural Resources	Other Marine Uses (excluding research surveys & navigation)	Scenic and Visual Resources, Recreation & Tourism										
NY/NJ	Atlantic Shores South, OCS-A 0499	COP, ROD	X	X	X		X	X	X	X	211	21	289	294	294	294	714	282	301	301
NY/NJ	Atlantic Shores North, OCS-A 0549	COP	X	X	X		X	X	X	X	166	25	190	3,393	393	393	416	2,162	301	301
NY/NJ	Ocean Wind 1, OCS-A 0498	COP Approved (ROD issued 2023), PPA	X	X	X		X	X	X	X	101	4	84	1,935[12]	78	94	19	1,850[13]	144	77
NY/NJ	Ocean Wind 2, OCS-A 0532	PPA	X	X	X		X	X	X	X	111	17	130	170	24	24	292.8	887	219	0
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, ROD, COP approval	X	X	X		X	X	X	X	58	1.14	52.44	368	37	33	9	534	82	26
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP, ROD, COP approval	X	X	X		X	X	X	X	91	2	82.80	360	24	32	9	633	129	32
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)		X	X	X	X	X	X	X	X	1,125[14]	NA	NA	28,137[15]	NA	NA	NA	25,120[16]	NA	NA
	Total NY/NJ Leases										**1,863**	**70**	**828**	**226,234**	**850**	**870**	**1,460**	**214,631**	**1,176**	**737**
	Total MA, RI, DE, MD, NC, SC, VA Leases										**1,817**	**333**	**4,065**	**13,912**	**0**	**898**	**4,395**	**39,161**	**1,924**	**671**
	OCS Total										**3,680**	**403**	**4,893**	**240,146**	**850**	**1,768**	**5,855**	**253,792**	**3,100**	**1,408**

[1] BOEM recognizes that the estimates presented within this cumulative analysis are likely high, conservative estimates; however, BOEM believes that this analysis is appropriately capturing the potential cumulative impacts and errs on the side of maximum impacts.
[2] This column identifies lease areas that are applicable to each resource based on the geographic analysis areas.
[3] The estimated number of foundations is the total number of turbines plus OSSs and met towers. If information for a future project could not be obtained from a publicly available COP, it is assumed that for every 50 turbines there would be one OSS installed.
[3] BOEM used the estimated foundation footprint acreage provided in the COP (if available). If not available, BOEM used this formula: foundation footprint = 0.26 acre * foundation number.
[4] The WTG seabed disturbance with the addition of scour protection was calculated based on scour protection expected in submitted COPs. If not available, BOEM used this formula: (1 acre * foundation #) + foundation footprint.
[5] BOEM used the estimated offshore export cable seabed disturbance provided in the COP (if available). If not available, BOEM used this formula: ([COP export cable length OR estimated export cable length)] * 5,280 feet/mile * installation tool disturbance width)/(43,560 square feet/acre)
[6] BOEM used the estimated offshore export cable footprint provided in the COP (if available). If not available, BOEM used this formula: ([COP export cable length OR estimated export cable length] * 5,280 feet/mile * 1 foot)/(43,560 square feet/acre).
[7] BOEM used the estimated offshore export cable hard protection area provided in the COP (if available). If not available, BOEM used this formula: ([COP export cable length OR estimated export cable length] * 5,280 feet/mile * 0.10 * 9.8 feet) / (43,560 square feet/acre).
[8] BOEM used the estimated anchoring disturbance area provided in the COP (if available). If not available, BOEM used this formula: (COP export cable length OR estimated export cable length) * (the corresponding subregion total COP anchoring disturbance per export cable length total).
[9] BOEM used the estimated interarray construction footprint/seabed disruption area provided in the COP (if available). If not available, BOEM used this formula: foundation # * (the corresponding subregion total COP interarray construction seabed disruption per foundation total).
[10] BOEM used the estimated interarray operating footprint/seabed disruption area provided in the COP (if available). If not available, BOEM used this formula: foundation # * (the corresponding subregion total COP interarray operating seabed disruption per foundation total).
[11] BOEM used the estimated interarray hard protection area provided in the COP (if available). If not available, BOEM assumed the interarray cable hard protection to be zero.
[12] Includes disturbance from offshore export cables and substation interconnector cables. Assumes an 82-foot-wide corridor would be disturbed per cable, based on the Ocean Wind 1 COP.
[13] Assumes an 82-foot-wide corridor would be disturbed, based on the Ocean Wind 1 COP.
[14] Total foundations are the anticipated number of WTG and OSS across all six NY Bight lease areas provided by the lessees. These are estimates used for analysis purposes only and do not reflect the actual number of foundations that may be constructed in each NY Bight lease area.
[15] Calculated based on maximum length of export cable of 1,772 miles and 131 maximum feet (width) of disturbance from the RPDE.
[16] Calculated based on maximum length of interarray cable of 1,582 miles and 131 maximum feet (width) of disturbance from the RPDE.
NJ = New Jersey; NA = not applicable; NY = New York; PPA = Power Purchase Agreement

Table D2-3. Offshore wind development activities on the U.S. East Coast: projects and assumptions (part 3, gallons of coolant, oils, lubricants, and diesel fuel) August 2024[1]

Region	Lease/Project/Lease Remainder	Status	Geographic Analysis Area (X denotes lease area is within or overlaps analysis area)[2]								Total Coolant Fluids in WTGs (gallons)[3]	Total Coolant Fluids in OSS or ESP (gallons)[4]	Total Oils and Lubricants in WTGs (gallons)[5]	Total Oils and Lubricants in OSS or ESP (gallons)[6]	Total Diesel Fuel in WTGs (gallons)[7]	Total Diesel Fuel in OSS or ESP (gallons)[8]
			Air Quality and GHG Emissions, Water Quality, Navigation and Vessel Traffic	Benthic Resources	Birds, Bats, Marine Mammals, Sea Turtles, Finfish, Invertebrates, EFH, Fisheries, Research Surveys	Coastal Habitat and Fauna	Demographics, Employment, and Economics; Environmental Justice	Cultural Resources	Other Marine Uses (excluding research surveys & navigation)	Scenic and Visual Resources, Recreation & Tourism						
NY/NJ	Atlantic Shores South, OCS-A 0499[9]	COP, ROD	X	X	X	X	X	X	X	X	820,000	37,960	606,200	750,020	80,000	280,000
NY/NJ	Atlantic Shores North OCS-A 0549	COP (unpublished), SAP	X	X	X	X	X	X	X	X	643,700	9,150	530,817	557,850	62,800	20,000
NY/NJ	Ocean Wind 1, OCS-A 0498	COP Approved (ROD issued 2023)	X	X	X		X	X	X	X	39,690	0	187,964	238,707	77,714	158,502
NY/NJ	Ocean Wind 2, OCS-A 0532	PPA	X	X	X		X	X	X	X	336,184	7,248	424,821	232,948	45,437	3,070
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X	X	X		X	X	X	X	49,704	0	285,684	158,503	0	7,925
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X	X	X		X	X	X	X	78,480	0	451,080	158,503	0	7,925
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	X	X	X	X	X	X	X	NA	NA	NA	NA	NA	NA
	Total NY/NJ Leases										**1,967,758**	**54,358**	**2,486,566**	**2,096,531**	**265,951**	**477,422**
	Total MA, RI, DE, MD, NC, SC, VA Leases										**4,528,301**	**107,378**	**7,882,431**	**5,396,469**	**1,171,257**	**1,041,998**
	OCS Total										**6,496,059**	**161,736**	**10,368,997**	**7,493,000**	**1,437,208**	**1,519,420**

[1] BOEM recognizes that the estimates presented within this cumulative analysis are likely high, conservative estimates; however, BOEM believes that this analysis is appropriately capturing the potential cumulative impacts and errs on the side of maximum impacts.
[2] This column identifies lease areas that are applicable to each resource based on the geographic analysis areas.
[3] BOEM estimated the total coolant fluids in WTGs using this formula: (sum of all coolants provided in the COP [any material used as a coolant, not including water]) * turbine #.
[4] BOEM estimated the total coolant fluids in OSSs or ESPs using this formula: (sum of all coolants provided in the COP [any material used as a coolant, not including water]) * ESP/OSS #.
[5] BOEM estimated the total oils and lubricants in WTGs using this formula: (sum of all oils & lubricants provided in the COP) * turbine #.
[6] BOEM estimated the total oils and lubricants in OSSs or ESPs using this formula: (sum of all oils & lubricants provided in the COP) * turbine #.
[7] BOEM estimated the total diesel fuel in WTGs using this formula: (sum of all diesel fuel provided in the COP) * turbine #.
[8] BOEM estimated the total diesel fuel in OSSs or ESPs using this formula: (sum of all diesel fuel provided in the COP) * ESP/OSS #.
[9] Atlantic Shores South may include up to 10 small OSSs, up to 5 medium OSSs, or up to 4 large OSSs. The total values for diesel fuel, coolants, and oils/lubricants for Atlantic Shores OSS in Table D.A-3 are based on 4 large OSSs; 4 large OSSs would result in larger volumes of diesel fuel, coolants, and oils/lubricants than would 10 small OSSs or 5 medium OSSs. The total values for 10 small OSSs for Atlantic Shores South would be 75,000 gallons diesel fuel, 381,600 gallons oils/lubricants, and 15,060 coolants. The total values for 5 medium OSSs would be 60,000 gallons diesel fuel, 563,825 gallons oils/lubricants, and 15,010 gallons coolants.
[10] Quantities of coolant, oil and lubricants, and diesel fuel are scaled to Ocean Wind 1 based on number of turbines and OSSs.
ESP = electrical service platform; NA = not applicable; NJ = New Jersey; NY = New York; PPA = Power Purchase Agreement

Table D2-4. Offshore wind development activities on the U.S. East Coast: projects and assumptions (part 4, OCS construction and operation emissions) August 2024

Region	Lease/Project/Lease Remainder	Status	Air Quality and GHG Emissions Geographic Analysis Area[1]	2023	2024	2025	2026	2027	2028	2029	2030	Beyond 2030
Nitrogen oxides (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		3,855	3,855	3,855	479	479	479	479	479
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				2,505	2,505	2,505	2,505	2,505	479
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X				2,235	2,235	2,235	2,235	2,235	159
NY/NY	Ocean Wind 2, OCS-A 0532	Planning	X				1,033	1,033	1,033	1,033	1,033	327
NY/NY	Atlantic Shores North, OCS-A 0499 remainder	COP	X							1,059	1,059	1,059
NY/NY	Atlantic Shores South, OCS-A 0499	COP Approved (ROD issued 2024)	X			880	880	880	880	519	519	519
NY/NY	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 5,221 Six Projects: 31,325	One Project: 5,221 Six Projects: 31,325	One Project: 5,221 Six Projects: 31,325	One Project: 5,221 Six Projects: 31,325	One Project: 5,221 Six Projects: 31,325	One Project: 227 Six Projects: 1,362
	Total Air Quality Analysis Area			**0**	**3,855**	**4,735**	**41,833**	**38,457**	**38,457**	**39,155**	**39,155**	**4,384**
Volatile organic compounds (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		172	172	172	21	21	21	21	21
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				111	111	111	111	111	21
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X				59	59	59	59	59	4
NY/NJ	Ocean Wind 2, OCS-A 0532	Planning	X				66	66	66	66	66	4
NY/NJ	Atlantic Shores North, OCS-A 0499 remainder	COP	X							25	25	25
NY/NJ	Atlantic Shores South, OCS-A 0499	COP Approved (ROD issued 2024)	X			10	10	10	10	9	9	9
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 151 Six Projects: 906	One Project: 151 Six Projects: 906	One Project: 151 Six Projects: 906	One Project: 151 Six Projects: 906	One Project: 151 Six Projects: 906	One Project: 5 Six Projects: 30
	Total Air Quality Analysis Area			**0**	**172**	**182**	**1,324**	**1,173**	**1,173**	**1,197**	**1,197**	**114**
Carbon monoxide (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		1,109	1,109	1,109	228	228	228	228	228

Region	Lease/Project/Lease Remainder	Status	Air Quality and GHG Emissions Geographic Analysis Area[1]	2023	2024	2025	2026	2027	2028	2029	2030	Beyond 2030
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				756	756	756	756	756	228
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X				431	431	431	431	431	40
NY/NJ	Ocean Wind 2, OCS-A 0532	Planning	X				203	203	203	203	203	77
NY/NJ	Atlantic Shores North, OCS-A 0499 remainder	COP	X							267	267	267
NY/NJ	Atlantic Shores South, OCS-A 0499	COP Approved (ROD issued 2024)	X			126	126	126	126	121	121	121
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 1,111 Six Projects: 6,666	One Project: 1,111 Six Projects: 6,666	One Project: 1,111 Six Projects: 6,666	One Project: 1,111 Six Projects: 6,666	One Project: 1,111 Six Projects: 6,666	One Project: 52 Six Projects: 312
	Total Air Quality Analysis Area			**0**	**1,109**	**1,235**	**9,291**	**8,410**	**8,410**	**8,672**	**8,672**	**1,273**
Particulate matter, 10 microns or less (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		111	111	111	13	13	13	13	13
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				72	72	72	72	72	13
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X	0			73	73	73	73	73	6
NY/NJ	Ocean Wind 2, OCS-A 0532	Planning	X				37	37	37	37	37	11
NY/NJ	Atlantic Shores North, OCS-A 0499 remainder	COP	X							62	62	62
NY/NJ	Atlantic Shores South, OCS-A 0499	COP Approved (ROD issued 2024)	X			18	18	18	18	17	17	17
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 105 Six Projects: 632	One Project: 105 Six Projects: 632	One Project: 105 Six Projects: 632	One Project: 105 Six Projects: 632	One Project: 105 Six Projects: 632	One Project: 5 Six Projects: 30
	Total Air Quality Analysis Area			**0**	**111**	**129**	**943**	**845**	**845**	**906**	**906**	**152**
Particulate matter, 2.5 microns or less (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		107	107	107	12	12	12	12	12
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				69	69	69	69	69	12
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X	0			70	70	70	70	70	5

Region	Lease/Project/Lease Remainder	Status	Air Quality and GHG Emissions Geographic Analysis Area[1]	2023	2024	2025	2026	2027	2028	2029	2030	Beyond 2030
NY/NJ	Ocean Wind 2, OCS-A 0532	Planning	X				31	31	31	31	31	10
NY/NJ	Atlantic Shores North, OCS-A 0499 remainder	COP Approved (ROD issued 2024)	X							34	34	34
NY/NJ	Atlantic Shores South, OCS-A 0499	COP, PPA, SAP	X			22	22	22	22	15	16	16
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 101 Six Projects: 605	One Project: 101 Six Projects: 605	One Project: 101 Six Projects: 605	One Project: 101 Six Projects: 605	One Project: 101 Six Projects: 605	One Project: 4 Six Projects: 24
	Total Air Quality Analysis Area			**0**	**107**	**129**	**904**	**809**	**809**	**836**	**837**	**113**
Sulfur dioxide (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		74	74	74	7	7	7	7	7
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				47	47	47	47	47	7
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X	0			23	23	23	23	23	1
NY/NJ	Ocean Wind 2, OCS-A 0532	Planning	X				8	8	8	8	8	1
NY/NJ	Atlantic Shores North, OCS-A 0499 remainder	COP	X							5	5	5
NY/NJ	Atlantic Shores South, OCS-A 0499	COP Approved (ROD issued 2024)	X			2	2	2	2	1	1	1
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 203 Six Projects: 1,217	One Project: 203 Six Projects: 1,217	One Project: 203 Six Projects: 1,217	One Project: 203 Six Projects: 1,217	One Project: 203 Six Projects: 1,217	One Project: 9 Six Projects: 54
	Total Air Quality Analysis Area			**0**	**74**	**76**	**1,371**	**1,304**	**1,304**	**1,308**	**1,308**	**76**
Carbon dioxide (tons)												
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP Approved (ROD issued 2023)	X		255,028	255,028	255,028	45,918	45,918	45,918	45,918	45,918
NY/NJ	Empire Wind 2, part of OCS-A 0512	COP Approved (ROD issued 2023)	X				171,384	171,384	171,384	171,384	171,384	45,918
NY/NY	Ocean Wind 1, OCS-A 498	COP Approved (ROD issued 2023)	X				131,263	131,263	131,263	131,263	131,263	11,752
NY/NJ	Ocean Wind 2, OCS-A 0532	Planning	X				65,195	65,195	65,195	65,195	65,195	21,891

Region	Lease/Project/Lease Remainder	Status	Air Quality and GHG Emissions Geographic Analysis Area[1]	2023	2024	2025	2026	2027	2028	2029	2030	Beyond 2030
NY/NJ	Atlantic Shores North, OCS-A 0499 remainder	COP	X							99,893	99,893	99,893
NY/NJ	Atlantic Shores South, OCS-A 0499	COP Approved (ROD issued 2024)	X			34,839	34,839	34,839	34,839	33,566	33,566	33,566
NY/NJ	NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544)	Planning	X	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 0 Six Projects: 0	One Project: 306,793 Six Projects: 1,840,758	One Project: 306,793 Six Projects: 1,840,758	One Project: 306,793 Six Projects: 1,840,758	One Project: 306,793 Six Projects: 1,840,758	One Project: 306,793 Six Projects: 1,840,758	One Project: 12,505 Six Projects: 75,030
	Total Air Quality Analysis Area			**0**	**255,028**	**289,867**	**2,498,467**	**2,289,357**	**2,289,357**	**2,387,977**	**2,387,977**	**333,968**

[1] This column identifies lease areas that are applicable to each resource based on the geographic analysis areas.

Note: Emissions for NY Bight were calculated based upon RPDE values using the BOEM Wind Tool model. Emissions for NY Bight Six Projects were calculated as six times the values for One Project. Based on input from the lessees, the calculated emissions for Six Projects are likely to be conservative (tending to overestimate emissions). Emissions for Ocean Wind 2 and Atlantic Shores North are scaled from Ocean Wind 1 and Atlantic Shores South, respectively, based on number of turbines and estimated construction schedule.

NJ = New Jersey; NY = New York; PPA = Power Purchase Agreement

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Attachment D3: References Cited

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Appendix E: Analysis of Incomplete and Unavailable Information

In accordance with Section 1502.21 of the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement (EIS) and when information is incomplete or unavailable, the agency shall make clear that such information is lacking. When incomplete or unavailable information was identified, the Bureau of Ocean Energy Management (BOEM) considered whether the information was relevant to the assessment of impacts and essential to its analysis of alternatives based upon the resource analyzed. If essential to making a reasoned choice among the alternatives, BOEM considered whether it was possible to obtain the information and if the cost of obtaining it was exorbitant. If it could not be obtained or if the cost of obtaining it was exorbitant, BOEM applied acceptable scientific methodologies to inform the analysis in light of this incomplete or unavailable information.

Because the Programmatic EIS (PEIS) is being prepared prior to the submittal of Construction and Operations Plans (COPs), the specific locations of wind turbine generators (WTGs) and offshore substations (OSSs), interarray cables, offshore and onshore export cable routes, cable landfall locations, and onshore facility locations for the New York Bight (NY Bight) projects are not known at this time. Therefore, site-specific impacts associated with the construction and installation, operations and maintenance (O&M), and conceptual decommissioning of these facilities that deviate from the broad-scale analysis presented in the PEIS will be analyzed in subsequent COP-specific NEPA documents. Because the analysis in the Final PEIS is intended to be programmatic in nature and because future site-specific NEPA analysis will be required for each COP, BOEM does not believe site-specific information on facility locations is essential to the reasoned choice among alternatives. The following sections present an analysis by resource topic of incomplete or unavailable information in the PEIS.

E.1 Incomplete or Unavailable Information Analysis for Resource Areas

E.1.1 Air Quality and Greenhouse Gas Emissions

BOEM expects that any action alternative would lead to reduced emissions regionally and a net improvement in regional air quality because offshore wind energy would displace a portion of the energy generated from fossil fuel combustion. Although a quantitative emissions inventory analysis of the region, and regional modeling of pollutant concentrations over the next 30 to 35 years would more accurately assess the overall impacts of the changes in emissions from the six NY Bight projects, regional air quality conditions would apply to the programmatic alternatives and subsequent project-specific alternatives alike. When specific projects are proposed and undergo Outer Continental Shelf (OCS) air quality permitting, the required air quality modeling will provide additional insight into regional air quality conditions. Construction cannot begin on any project before an air permit is acquired. As such, the analysis provided in the Final PEIS is sufficient to support sound scientific judgments and informed decision-making related to the use of the offshore portions of the NY Bight lease areas and offshore export cable route corridors. Therefore, BOEM does not believe that there is incomplete or unavailable information on air quality that is essential to making a reasoned choice among alternatives.

E.1.2 Water Quality

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on water quality. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on water quality will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

E.1.3 Bats

Habitat use and distribution of bats vary between seasons and species; therefore, there will always be some level of incomplete information on the distribution and habitat use of bats in the offshore portions of the NY Bight lease areas. Additionally, surveying bat activity offshore provides challenges as limited methods have been developed and tested for surveying within this environment. No BOEM-issued guidance for bat surveys currently exists for renewable energy development on the OCS. However, an evaluation of scientific studies and available, relevant information was examined, including New York State Energy Research and Development Authority (NYSERDA) remote metocean data from two buoys in two of the NY Bight lease areas (see Section 3.5.1.1, *Description of the Affected Environment and Future Baseline Conditions*), to provide a baseline understanding of the presence, abundance, and seasonality of bats that may occur within the NY Bight lease areas.

Given the infancy of U.S. offshore wind development, there is some level of uncertainty regarding the potential collision risk to individual bats that may be present within the offshore portions of the NY Bight lease areas. However, sufficient information on collision risk to bats observed at land-based U.S. wind projects exists and was used to analyze and corroborate the potential for this impact as a result of WTG operations in the NY Bight lease areas. In addition, as described in Section 3.5.1, *Bats*, the likelihood of a bat encountering an operating WTG during migration is very low; therefore, the differences among alternatives with respect to bats for wind development in the NY Bight lease areas are expected to be small. As such, the analysis provided in the Final PEIS is sufficient to support sound scientific judgments and informed decision-making related to distribution and use of the offshore portions of the NY Bight lease areas as well as to the potential for collision risk of bats. Consequently, BOEM does not believe that there is incomplete or unavailable information on bat resources that is essential to making a reasoned choice among alternatives.

E.1.4 Benthic Resources

There is uncertainty regarding the spatial and temporal distribution of benthic (faunal) resources and periods during which they might be especially vulnerable to disturbance; however, project-specific COP surveys of benthic resources for other nearby projects and a broad-scale study (Guida et al. 2017) provided a suitable basis for generally predicting the species, abundances, and distributions of benthic resources within the geographic analysis area. Uncertainty also exists regarding the impact of some impact-producing factors (IPFs) on benthic resources. For example, specific stimulus-response related to acoustics and electromagnetic fields (EMFs) is not well studied, although there is some emerging information from benthic monitoring at European wind facilities and the Block Island Wind Farm in the United States that allows for a broad understanding of the impacts. Similarly, specific secondary impacts, such as changes in diets throughout the food chain resulting from habitat modification and synergistic behavioral impacts from multiple IPFs, are not fully known. Again, results of benthic monitoring at European wind facilities and the Block Island Wind Farm in the United States provide general knowledge of the overall impacts of these IPFs combined, if not individually. Therefore, the analysis provided in the Final PEIS is sufficient to support sound scientific judgments and informed decision-making related to the overall impacts. For these reasons, BOEM does not believe that there is incomplete or unavailable information on benthic resources that is essential to making a reasoned choice among alternatives.

E.1.5 Birds

Habitat use and distribution of birds vary between seasons, species, and years; therefore, there will always be some level of incomplete information on the distribution and habitat use of birds in the offshore portions of the geographic analysis area, including the NY Bight lease areas. Additionally, given the infancy of U.S. offshore wind development, there will be some level of uncertainty regarding the potential for collision risk and avoidance behaviors for some of the bird species that may be present within the offshore portions of the geographic analysis area. For the Final PEIS, publicly available avian survey data (e.g., NYSERDA remote metocean data from two buoys), marine life data and analysis team (MDAT) modeling, and NYSERDA aerial digital avian survey data that covers most of the NY Bight lease areas were used to describe bird presence and inform the analysis of potential adverse impacts on bird resources in the offshore environment.

Bird mortality data are available for onshore wind facilities and, based on several assumptions regarding their applicability to offshore environments, were used to inform the analysis of bird mortality associated with the offshore WTGs analyzed in the Final PEIS. However, uncertainties exist regarding the use of the onshore bird mortality rate to estimate the offshore bird mortality rate due to differences in species groups present and life history and behavior of species as well as differences in the offshore marine environment compared to onshore habitats.

Modeling is commonly used to predict the potential mortality rates for bird species in Europe and the United States (BOEM 2015, 2021). Due to inherent data limitations, these models often represent only a subset of species potentially present. Still, the datasets used by BOEM (e.g., MDAT) to assess the potential for exposure of birds to the NY Bight lease areas represent the best available data and provide context at both local and regional scales. Furthermore, sufficient and relevant information on collision risk and avoidance behaviors observed in related species at European offshore wind projects is available and was used to analyze and corroborate the potential for these impacts as a result of wind farm operations in the NY Bight lease areas (e.g., Skov et al. 2018). As such, the analysis provided in the Final

PEIS is sufficient to support sound scientific judgments and informed decision-making related to distribution and use of the offshore portions of the geographic analysis area as well as to the potential for collision risk and avoidance behaviors in bird resources. Furthermore, the similarity between the different alternatives does not render any of this incomplete and unavailable information essential to making a reasoned choice among alternatives. Therefore, BOEM does not believe that there is incomplete or unavailable information on birds that is essential to making a reasoned choice among alternatives.

E.1.6 Coastal Habitat and Fauna

Although the preferred habitats of terrestrial and coastal fauna are generally known, specific data on abundances and distributions within the geographic analysis area of various fauna within these habitats are likely to remain unknown without site-specific surveys. However, the species inventories and other general information about the area provide an adequate basis for evaluating the fauna likely to inhabit the onshore geographic analysis area. Additionally, the onshore activities expected to be proposed involve only common, industry-standard activities for which impacts are generally understood. Therefore, BOEM believes that the analysis provided in the Final PEIS is sufficient to make a reasoned choice among the alternatives in terms of coastal habitat and fauna.

E.1.7 Finfish, Invertebrates, and Essential Fish Habitat

There is some uncertainty regarding the spatial and temporal distribution of finfish and invertebrate resources and periods during which they might be especially vulnerable to disturbance; however, project-specific COP aquatic resource surveys for other nearby projects and a broad-scale study (Guida et al. 2017) provided a suitable basis for general predictions of finfish and invertebrate resources with respect to species, densities, and distributions within the geographic analysis area. Future project-specific Biological Assessments (BAs) and essential fish habitat (EFH) assessments will be prepared for each offshore wind project and will provide additional information about impacts on Endangered Species Act (ESA) listed species and EFH. While impacts on specific finfish and invertebrate species are not anticipated to vary from the general impacts provided in the Final PEIS, specific impact discussions for ESA-listed species and EFH will be provided in these future assessments.

Uncertainty also exists regarding the impact of some IPFs on invertebrate resources, such as the effects of EMFs and underwater noise (e.g., generated from pile-driving activities). The available information on invertebrate sensitivity to EMF is equivocal (Hutchinson et al. 2020), and sensitivity to sound pressure and particle motion effects is not well understood for many species, nor are synergistic or antagonistic impacts from multiple IPFs. Similarly, specific secondary impacts such as changes in diets throughout the food chain resulting from habitat modification are not well known for finfish and invertebrates. Where applicable, the analysis drew upon information in the available literature and an increasing number of monitoring and research studies related to wind development, other undersea development, or artificial reefs in Europe and the United States, several of which were recently drafted or published. These monitoring studies help provide a broad understanding of the overall impacts of the combined IPFs, if not individually.

For these reasons, the information provided in the Final PEIS is sufficient to support sound scientific judgments and informed decision-making related to the overall impacts. Therefore, BOEM does not believe that there is incomplete or unavailable information on finfish, invertebrate, and EFH resources that is essential to making a reasoned choice among alternatives.

E.1.8 Marine Mammals

The National Marine Fisheries Service (NMFS) has summarized the most current information about marine mammal population status, occurrence, and use of the region in its stock status reports for the Atlantic OCS and Gulf of Mexico (Waring et al. 2015; Hayes et al. 2019, 2020, 2021, 2022; Palka et al. 2021, 2017). These studies provided a suitable basis for predicting the species, abundances, and distributions of marine mammals in the geographic analysis area. However, population trend data from NMFS are unavailable for 32 species (of which only 7 are common or regular in the NY Bight area), and annual human-caused mortality is unknown for two species (see Table 3.5.6-1 in the Final PEIS). Most species lacking population trend data are offshore species, such as blue whale, fin whale, and non-porpoise odontocetes (e.g., beaked whales and dolphins). As a result, there is uncertainty regarding how the NY Bight lease area project activities and cumulative effects may affect these populations. In addition to species distribution information, effects of some IPFs on marine mammals are also uncertain or ambiguous, as described below.

Potential effects of EMF have not been scaled to consider impacts on marine mammal populations or their prey in the geographic analysis area (Taormina et al. 2018). The widespread ranges of marine mammals and difficulty obtaining permits make experimental studies challenging. As a result, few scientific studies have been conducted that examine the effects of altered EMF on marine mammals. Scientific studies summarized by Normandeau et al. (2011) demonstrate that marine mammals are sensitive to, and can detect, small changes in magnetic fields (Section 3.5.6, *Marine Mammals*), but potential impacts would likely only occur within a few feet of cable segments. Therefore, the current literature does not support a conclusion that EMF could lead to changes in behavior that would cause significant adverse effects on marine mammal populations.

The behavioral effects of anthropogenic noises on marine mammals are increasingly being studied. However, behavioral responses vary depending on a variety of factors such as life stage, previous experience, and current behavior (e.g., feeding, nursing), and they are therefore difficult to predict. In addition, the current NMFS disturbance criteria apply a single threshold for all marine mammals for impulsive noise sources and do not consider the overall duration, exposure, or frequency content of the sound to account for species-dependent hearing acuity. While elevated underwater sound could startle or displace animals, behavioral responses are not necessarily predictable from received levels alone (Southall et al. 2007).

In addition, research regarding the potential behavioral effects of pile-driving noise has generally focused on harbor porpoises and seals; studies that examine the behavioral responses of baleen whales to pile-driving activities are absent from the literature. Of the available research, most studies (e.g., Brandt et al. 2016; Dahne et al. 2013; Benhemma-Le Gall et al. 2021) conclude that, although pile-driving activities could cause avoidance behaviors or disruption of feeding activities, individual harbor porpoises and seals would likely return to normal behaviors once the activity had stopped; this is unknown for baleen whales and other marine mammals. Uncertainty remains regarding the long-term cumulative acoustic impacts associated with multiple pile-driving projects that may occur over several years. An acoustic narrative in Appendix J, *Introduction to Sound and Acoustic Assessment*, Section, J.4, *Acoustic Assessment,* drawing on the hypothetical case study of two wind farms constructed in New England, provides further insight about the relative risk of multi-project development on select marine mammal species and the factors that should be considered in reducing acoustic impacts. This also applies to other project activities (e.g., vessel traffic, high-resolution geophysical (HRG) surveys, geotechnical drilling, dredging activities) that may elicit behavioral reactions in marine mammals. As a result, it is not possible to predict with certainty the potential long-term behavioral effects on marine mammals from the project-related pile-driving or other activities, as well as ongoing concurrent and cumulative pile-driving and other activities.

The Final PEIS used the best available information when considering behavioral effects related to underwater noise to address this uncertainty. For the assessment of large baleen whales, studies on other impulsive noises (e.g., airguns) were used to inform the potential behavioral reactions to pile-driving noise (Southall et al. 2021, McCauley et al. 1998, Johnson 2002, Richardson et al. 1999). Monitoring studies would provide insight into species-specific behavioral reactions to project-generated underwater noise. Long-term monitoring of concurrent and multiple projects could inform the understanding of long-term effects and subsequent consequences from cumulative underwater noise activities on marine mammal populations.

There is a lack of research regarding the responses of large whale species to extensive networks of new structures due to the novelty of offshore wind development on the Atlantic OCS. Although new structures are anticipated from multiple offshore wind projects in the NY Bight area (see Chapter 2, *Alternatives*), it is expected that spacing would allow large whales to access areas within and between wind facilities. No physical obstruction of marine mammal migration routes or habitat areas are anticipated, but it is unknown if avoidance of offshore wind lease areas due to new structures would occur. Additionally, while there is some uncertainty regarding how hydrodynamic changes around foundations may affect prey availability, these changes are expected to have limited impacts on the local conditions around WTG foundations. The potential consequences of these impacts on marine mammals are unknown. Monitoring studies would provide insight into species-specific avoidance behaviors and other potential behavioral reactions to project structures.

At present, the Final PEIS has no basis to conclude that these IPFs (i.e., noise, EMF, presence of structures) would result in significant adverse behavioral impacts on marine mammal populations.

BOEM determined that the overall costs of obtaining the missing information for or addressing these uncertainties are exorbitant, or the means to obtain it are unknown. Therefore, to address these gaps, BOEM extrapolated or drew assumptions from known information for similar species and studies using acceptable scientific methodologies to inform the analysis considering this incomplete or unavailable information, as presented in Section 3.5.6, *Marine Mammals*. The information and methods used to predict potential impacts on marine mammals represent the best available information, and the information provided in the Final PEIS is sufficient to support sound scientific judgments and informed decision-making. Therefore, BOEM does not believe that there is incomplete or unavailable information on marine mammal resources that is essential to making a reasoned choice among alternatives.

E.1.9 Sea Turtles

There are limited data and information on the distribution and abundance of sea turtle species that occur in the Atlantic OCS and the NY Bight lease areas. Four species of sea turtles are considered in the PEIS: the leatherback sea turtle, loggerhead sea turtle, Kemp's ridley sea turtle, and green sea turtle. A digital aerial baseline survey of marine wildlife was conducted off the southern shores of New York and northern shores of New Jersey by NYSERDA. The survey boundaries overlap with the majority of the NY Bight lease areas. Sea turtle abundance increased from the coastal zones out to the shelf break. Densities of sea turtles were most abundant in the summer months (Normandeau Associates Inc. and APEM Inc. 2021a, 2021b).

Future project-specific BAs will be prepared for each offshore wind project and will provide additional information about impacts on ESA-listed species. While impacts on sea turtles are not anticipated to vary from the general impacts provided in the Final PEIS, specific impact discussions for ESA-listed species will be provided in these future BAs.

Some uncertainty exists about the effects of certain IPFs on sea turtles and their habitats. The effects of EMF on sea turtles are not completely understood. However, the available relevant information is summarized in the BOEM-sponsored report by Normandeau et al. (2011) and a more recent review by Bilinski (2021). Although the thresholds for EMF disturbing various sea turtle behaviors are not known, the evidence suggests that impacts may only occur on hatchlings over short distances, and no adverse effects on sea turtles have been documented to occur from the numerous submarine power cables around the world.

There is also uncertainty about sea turtle responses to NY Bight project construction activities, and data are not available to evaluate potential changes to movements of juvenile and adult sea turtles due to elevated suspended sediments. However, although some exposure may occur, total suspended solid impacts would be limited in magnitude and duration and would occur within the range of exposures periodically experienced by these species. On this basis, any resulting impact on sea turtle behavior due to sediment plumes would likely be too small to be biologically meaningful, and no adverse impacts would be expected (NOAA 2020). Some potential exists for sea turtle displacement, but it is unclear if this would result in adverse impacts (e.g., because of lost foraging opportunities or increased exposure to potentially fatal vessel interactions). Additionally, it is currently unclear whether concurrent construction of multiple projects, increasing the extent and intensity of impacts over a shorter duration, or spreading out project construction with lower intensity impacts over multiple years would result in the least potential harm to sea turtles.

There is also uncertainty regarding the cumulative acoustic impacts associated with pile-driving activities. Information on sea turtle hearing is limited, and there are some discrepancies between hearing range determinations. Cumulative acoustic impacts associated with pile-driving activities are unknown, including whether sea turtles affected by construction activities would resume normal feeding, migrating, or breeding behaviors once daily pile-driving activities cease, or if secondary impacts would continue. Under the planned activities scenario, individual sea turtles may be exposed to acoustic impacts from multiple offshore wind projects in a single day or from one or more projects over the course of multiple days. Although the consequences of these exposure scenarios have been analyzed with the best available information, some level of uncertainty remains due to the lack of observational data on species' responses to pile-driving activities.

Some uncertainty exists regarding the potential for sea turtle responses to Federal Aviation Administration (FAA) hazard lights and navigation lighting associated with offshore wind development. Specific projects would limit lighting on WTGs and OSSs to minimum levels required by regulation for worker safety, navigation, and aviation. Although sea turtles' sensitivity to these minimal light levels is unknown, sea turtles do not appear to be adversely affected by oil and gas platform operations, which produce far more artificial light than offshore wind structures (BOEM 2019). The placement of new structures would be far from known nesting beaches, so no impacts on nesting female or hatchling sea turtles are anticipated.

Considerable uncertainty exists about how sea turtles would interact with the long-term changes in biological productivity and community structure resulting from the reef effect of offshore wind farms across the geographic analysis area. Artificial reef and hydrodynamic impacts could influence predator-prey interactions and foraging opportunities in ways that influence sea turtle behavior and distribution. Also, the extent of sea turtle entanglement on artificial reefs and shipwrecks is not captured in sea turtle stranding records, and the significance and potential scale of sea turtle entanglement in lost fishing gear are not quantified. These impacts are expected to interact with the ongoing influence of climate change on sea turtle distribution and behavior over broad spatial scales, but the nature and significance of these interactions are not predictable. BOEM anticipates that ongoing monitoring of offshore energy structures will provide some useful insights into these synergistic effects.

BOEM considered the level of effort required to address the uncertainties for sea turtles and determined that the methods necessary to do so are lacking or the associated costs would be exorbitant. Therefore, where appropriate, BOEM inferred conclusions about the likelihood of potential biologically significant impacts from available information for similar species and situations to inform the analysis considering this incomplete or unavailable information. These methods are described in greater detail in Section 3.5.7, *Sea Turtles*. Therefore, the analysis provided is sufficient to support sound scientific judgments and informed decision-making about the NY Bight projects with respect to impacts on sea turtles. For these reasons, BOEM does not believe that there is incomplete or unavailable information on sea turtles that is essential to making a reasoned choice among alternatives.

E.1.10 Wetlands

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on wetlands. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on wetlands will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

E.1.11 Commercial Fisheries and For-Hire Recreational Fishing

Fisheries are managed in the context of an incomplete understanding of fish stock dynamics and effects of environmental factors on fish populations. The commercial fisheries information used in this assessment has limitations. For example, vessel trip report data are only an approximation because this information is self-reported and may not account for all trips. The vessel trip report data also do not include all commercial fishing operations that may be affected by offshore wind development in the NY Bight lease areas and only represent vessel logbook data for species managed by the Greater Atlantic Regional Fisheries Office. While these data include incidental catch of Atlantic menhaden, highly migratory species, or species managed by the NMFS Southeast Regional Office (e.g., wahoo and mahi mahi), when targeting other species, they are not specifically identified as a subset of total catch of these species within the NY Bight lease areas. Additionally, available historical data lack consistency, making comparisons challenging.

Vessel monitoring system (VMS) data are also limited, with a number of factors contributing to their limitations.

- VMS coverage is not universal for all fisheries, with some fisheries (summer flounder, scup, black sea bass, bluefish, American lobster, spiny dogfish, skate, whiting, and tilefish) not covered at all by VMS.
- There is limited historical coverage for most fisheries (e.g., monkfish is optional and elective on a yearly basis, 2005 or earlier for herring, 2006 for groundfish and scallops, 2008 for surfclams/ocean quahogs, 2014 for mackerel, and 2016 for longfin squid/butterfish).
- Trip declaration does not necessarily correspond to actual operation.
- Hourly position pings limit area resolution based on speed.
- Fishing time/location can be mis-estimated by operational assumptions (speed and direction) that are affected by externalities (weather, sea state, mechanical issues).
- Catch data are limited for where there is no information on catch rates, retained catch composition is limited to target species and some bycatch species, and the data are not universal.
- Catch information is for the full trip, not sub-trips.
- Not all information is collected from all fisheries (gear type).

However, these data represent the best available data, and sufficient information exists to support the findings presented in the Final PEIS.

A second limitation is that recent annual revenue for for-hire recreational fishing in the NY Bight lease areas is not available. NMFS completed planning-level assessments of revenues from recreational party and charter vessels for each of the six lease areas (NMFS 2022a–f), but the assessments do not include detailed information on revenues from for-hire recreational fishing charters. However, BOEM does not believe that there is incomplete or unavailable information on commercial fisheries and for-hire recreational fishing resources that is essential to making a reasoned choice among alternatives.

E.1.12 Cultural Resources

At this stage of analysis, BOEM does not have enough information available from the lessees and their COPs or Project Design Envelopes (PDEs) to delineate either a cultural resources geographic analysis area or Programmatic Area of Potential Effects (APE) that would fully encompass all areas that may be subject to potential effects from NY Bight offshore wind project development. Specific areas associated with anticipated NY Bight offshore wind project development but excluded from delineation of the NY Bight Final PEIS cultural resources geographic analysis area and Programmatic APE are:

- Any other offshore areas, aside from the six NY Bight lease areas, potentially physically affected by seabed-disturbing activities (i.e., other marine areas in which temporary or permanent construction or staging areas are proposed to occur, such as offshore export cable route corridors and horizontal directional drilling [HDD] locations, which may have physical impacts on cultural resources).
- All onshore areas potentially physically affected by ground-disturbing activities (i.e., terrestrial areas in which temporary or permanent construction or staging areas are proposed to occur, such as onshore export cable route corridors, substations, or HDD locations, which may have physical impacts on cultural resources).
- Any other areas within the viewshed of offshore renewable energy structures measuring greater than 1,312 feet in height.
- Any other onshore areas potentially visually affected by the presence of onshore renewable energy structures (e.g., the viewshed from which onshore structures would be visible, such as onshore export cable routes, substations, or switching stations, and which may have visual impacts on cultural resources).

As discussed in Section 3.6.2, *Cultural Resources*, and Appendix I, *NHPA Section 106 Summary*, BOEM conducted background research to identify cultural resource types in the Programmatic APE. However, other cultural resources and cultural resource types subject to potential impacts and not identified in BOEM's background research are possible.

As part of compliance with federal and state requirements, offshore wind project applicants are required to conduct requisite cultural resource and historic property identification studies and commit to measures for avoiding, minimizing, or mitigating identified resources. BOEM will require each lessee to complete the requisite cultural resource technical studies per BOEM (2020) historic property identification guidelines including, but not limited to, the delineation of a preliminary APE (PAPE) per the COP PDE, completion of associated cultural resource and historic property identification efforts, assessment of potential effects, and development of potential avoidance, minimization, mitigation, and monitoring (AMMM) measures for identified historic properties. BOEM will then delineate the COP APE and assess the specific impacts on historic properties in the APE in COP-specific NEPA and National Historic Preservation Act (NHPA) documents.

BOEM considered the level of effort required to address the incomplete data described above for historic properties and determined that there is insufficient project definition to establish a comprehensive and sufficient cultural resources geographic analysis area that would account for all areas where project activities have the potential to result in impacts on marine cultural, terrestrial archaeological, or historic aboveground resources. Therefore, where appropriate, BOEM inferred conclusions about the likelihood of potential impacts from available information on cultural resource types likely to be present in the Programmatic APE to inform the analysis in light of this incomplete or unavailable information. These methods are described in greater detail in Section 3.6.2 and Appendix I. Therefore, the analysis provided is sufficient to support sound judgments and informed decision-making about the alternatives with respect to their impacts on cultural resources. For these reasons, BOEM does not believe that there is incomplete or unavailable information on cultural resources that is essential to making a reasoned choice among alternatives at this stage.

E.1.13 Demographics, Employment, and Economics

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on demographics, employment, and economics. However, no specific incomplete or unavailable information related to the analysis of impacts on demographics, employment, and economics was identified.

E.1.14 Environmental Justice

Evaluations of impacts on communities with environmental justice concerns rely on the assessment of impacts on other resources. As a result, incomplete or unavailable information related to other resources, as described in this appendix, also affects the completeness of the analysis of impacts on communities with environmental justice concerns.

As discussed in other sections, BOEM has determined that incomplete and unavailable resource information for environmental justice or for other resources on which communities with environmental justice concerns rely was either not relevant to assess reasonably foreseeable significant adverse impacts, was not essential to making a reasoned choice among alternatives, alternative data or methods could be used to predict potential impacts and provided the best available information, or the overall costs of obtaining the information were exorbitant or the means to do so were unknown. Therefore, the information provided in the Final PEIS is sufficient to support sound scientific judgments and informed decision-making related to the proposed uses of the onshore and offshore portions of the geographic analysis area.

Meaningful engagement with communities with environmental justice concerns is an essential element of assessing environmental justice impacts. For the PEIS, BOEM held a series of quarterly environmental justice forums with federal and state partners and community-based organizations that serve environmental justice and underserved communities (https://www.boem.gov/renewable-energy/state-activities/new-york-new-jersey-offshore-wind-environmental-justice-forums). As BOEM receives COPs for NY Bight projects, additional engagement opportunities, which provide information on locations for offshore and onshore infrastructure, will support COP-specific reviews.

E.1.15 Land Use and Coastal Infrastructure

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on land use and coastal infrastructure. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on land use and coastal infrastructure will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

E.1.16 Navigation and Vessel Traffic

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on navigation and vessel traffic. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on navigation and vessel traffic will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

E.1.17 Other Uses

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on other uses, including marine minerals, national security and military use, aviation and air traffic, cables and pipelines, radar systems, and scientific research and surveys. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on other uses will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

E.1.18 Recreation and Tourism

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on recreation and tourism. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on recreation and tourism will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

E.1.19 Scenic and Visual Resources

At this early analysis stage, there is some inherent uncertainty regarding the impacts of the activities covered in the PEIS on scenic and visual resources. However, the information that is available is appropriate for this programmatic level of analysis, and subsequent project-specific environmental analysis on scenic and visual resources will be required for each individual COP before any construction activities may begin. Therefore, BOEM does not believe that there is incomplete or unavailable information that is essential to making a reasoned choice among alternatives for this PEIS.

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Appendix F: Assessment of Resources with Moderate (or Lower) Impacts

Contents

List of Tables

List of Figures

F.1 Introduction

To focus on the impacts of most concern in the main body of this Final PEIS, BOEM has included the analysis of resources with no greater than **moderate** adverse impacts below. These include:

- Air quality and greenhouse gas emissions
- Water quality
- Bats
- Birds
- Coastal habitat and fauna
- Sea turtles
- Wetlands
- Demographics, employment, and economics
- Land use and coastal infrastructure
- Recreation and tourism

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3.4 Physical Resources

3.4.1 Air Quality and Greenhouse Gas Emissions

This section discusses potential impacts on air quality from the Proposed Action, alternatives, and ongoing and planned activities in the air quality and GHG emissions geographic analysis area. The air quality and GHG emissions geographic analysis area, as shown on Figure 3.4.1-1, includes the airshed within 25 miles (40 kilometers) of the NY Bight lease areas and the airshed within 15.5 miles (25 kilometers) of potential onshore construction areas and activities at representative ports supporting offshore construction for the NY Bight projects. In accordance with BOEM practice, the geographic analysis area for activities on the leases encompasses the geographic region that BOEM anticipates would be subject to USEPA review as part of OCS air permitting under the Clean Air Act (CAA) (42 USC 7409) for the NY Bight projects. The geographic analysis area also considers potential air quality impacts associated with the onshore construction areas and the mustering port(s) outside of the OCS permit area. Given the dispersion characteristics of emissions from marine vessels, equipment, vehicles, and other similar emission sources that would be used during proposed construction activities, the maximum potential air quality impacts would likely occur within a few miles of the emissions sources. For onshore areas, BOEM selected the 15.5-mile (25-kilometer) distance to assure that the locations of maximum potential air quality impact would be considered.

The air quality impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Refer to Appendix C, *Tiering Guidance,* which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

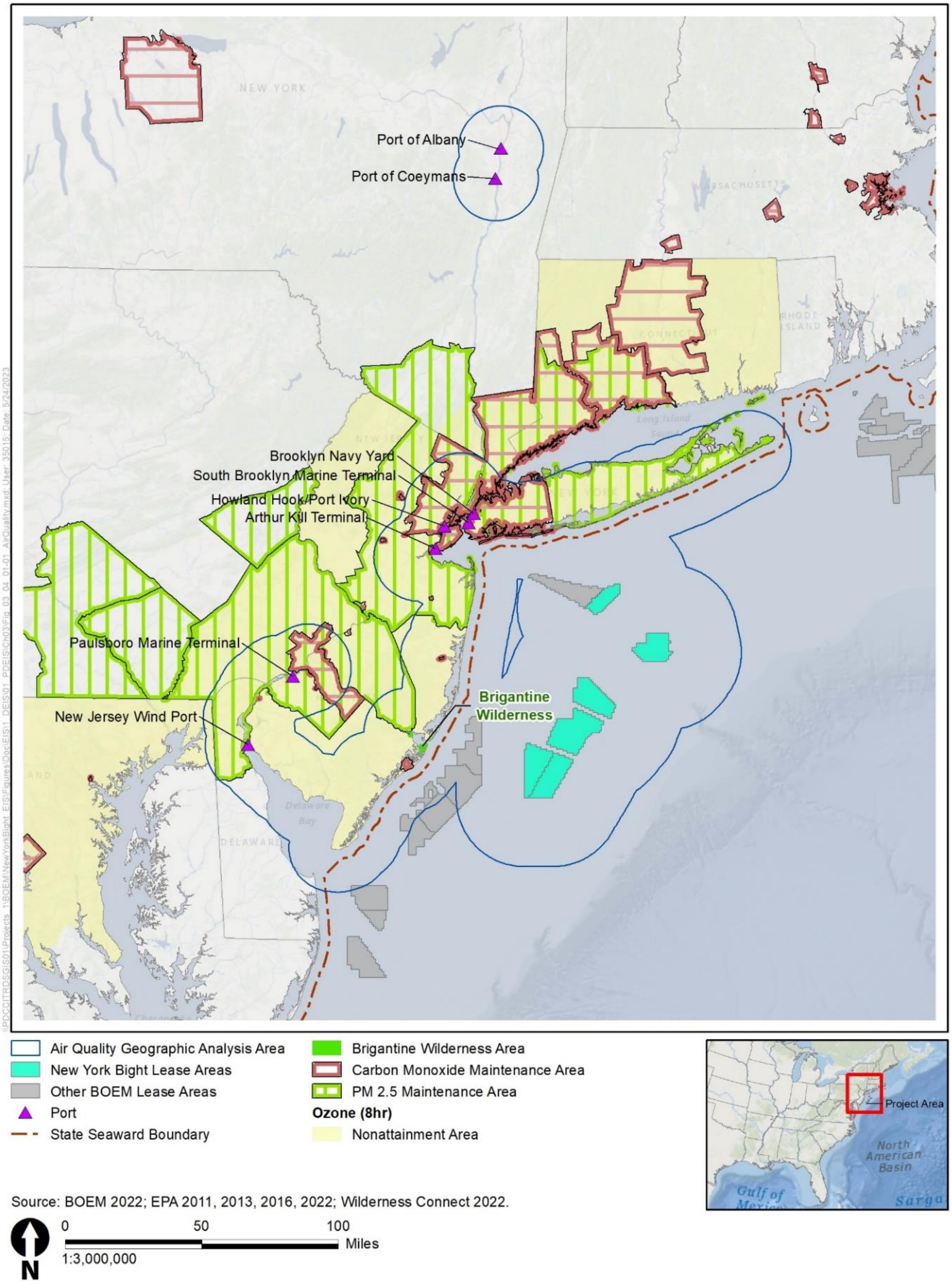

Figure 3.4.1-1. Air quality and GHG emissions geographic analysis area and attainment status

3.4.1.1 Description of the Affected Environment and Future Baseline Conditions

The overall geographic analysis area for air quality covers portions of northern and central Delaware, northeastern New Jersey, New York City, and Long Island; the area around the Port of Albany, New York; and over the ocean southeast of New York Harbor, as well as much of southern New Jersey and the adjacent portions of Delaware Bay and the Atlantic Ocean. This includes the air above the NY Bight projects and adjacent OCS area, potential offshore and onshore export cable routes, onshore substations and converter stations, construction staging areas, onshore construction and proposed project-related sites, and ports used to support construction and O&M activities. Appendix B, *Supplemental Information and Additional Figures and Tables,* provides information on climate and meteorological conditions in the NY Bight region.

Air quality within a region is measured in comparison to the National Ambient Air Quality Standards (NAAQS), which are established by USEPA pursuant to the CAA (42 USC 7409) for several common pollutants, known as criteria pollutants, to protect human health and welfare. The criteria pollutants are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) with diameter of 10 microns and smaller (PM_{10}), particulate matter with diameter of 2.5 microns and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). Table B.1-11 in Appendix B shows the NAAQS. New York and New Jersey have established ambient air quality standards (AAQS) that are similar to the NAAQS. Emissions of lead from offshore wind projects would be negligible because lead is not a component of liquid or gaseous fuels; accordingly, lead is not analyzed in this PEIS. Ozone is not emitted directly but is formed in the atmosphere from precursor chemicals, primarily nitrogen oxides (NO_X) and VOCs, in the presence of sunlight. Potential impacts of a project on O_3 levels are evaluated in terms of NO_X and VOC emissions.

USEPA designates all areas of the country as attainment, nonattainment, or unclassified for each criteria pollutant. An attainment area is an area where all criteria pollutant concentrations are within all NAAQS. A nonattainment area does not meet the NAAQS for one or more pollutants. Unclassified areas are those where attainment status cannot be determined based on available information and are regulated as attainment areas; this includes all of the OCS. An area can be in attainment for some pollutants and nonattainment for others. If an area was nonattainment at any point in the last 20 years but currently meets the NAAQS, then the area is designated a maintenance area. Nonattainment and maintenance areas are required to prepare a State Implementation Plan (SIP), which describes the region's program to attain and maintain compliance with the NAAQS. The attainment status of an area can be found at 40 CFR part 81 and in the USEPA Green Book (USEPA 2022). Attainment status for criteria pollutants is determined through evaluation of air quality data from a network of monitors.

The nearest onshore designated areas to the NY Bight lease areas are the New York City boroughs of Brooklyn, Queens, and Staten Island; the southern portion of Nassau County and the southwestern portion of Suffolk County, New York; and the northeastern portion of Monmouth County, New Jersey, as well as Ocean, Atlantic, and Cape May Counties in New Jersey. Parts or all of these counties are in designated nonattainment or maintenance areas for CO, $PM_{2.5}$, or O_3. The nonattainment areas include facilities that the NY Bight projects could use at the Port of Albany, Port of Coeymans, Brooklyn Navy Yard, South Brooklyn Marine Terminal, Howland Hook/Port Ivory, Arthur Kill Terminal, Paulsboro Marine

Terminal, and the New Jersey Wind Port. Figure 3.4.1-1 displays the nonattainment and maintenance areas[1] that intersect the geographic analysis area.

The CAA prohibits federal agencies from approving any activity that does not conform to a SIP. This prohibition applies only with respect to nonattainment or maintenance areas. Conformity to a SIP means conformity to a SIP's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of such standards. The activities for which BOEM has authority are outside of any nonattainment or maintenance area and therefore not subject to the requirement to show conformity. However, agencies issuing future approvals related to offshore wind projects in the NY Bight are responsible for evaluating the applicability of the CAA General Conformity requirements to their actions.

The CAA defines Class I areas as certain national parks and wilderness areas where very little degradation of air quality is allowed. Class I areas consist of national parks larger than 6,000 acres and wilderness areas larger than 5,000 acres that were in existence before August 1977. Projects subject to federal permits are required to notify the federal land manager responsible for designated Class I areas within 62 miles (100 kilometers) of a project.[2] The federal land manager identifies appropriate air quality–related values for the Class I area and evaluates the impact of a project on air quality–related values. The Brigantine Wilderness Area, approximately 35 miles (56 kilometers) southwest of the nearest edge of the NY Bight lease areas, is the only Class I area within 62 miles (100 kilometers) of the NY Bight projects. Air quality–related values identified by the U.S. Fish and Wildlife Service (USFWS) for Brigantine Wilderness include aquatic resources, fauna/wildlife, soils, vegetation, visibility, and acidic deposition (CSU 2022). Because there is the potential to affect a Class I area, these impacts will need to be evaluated for each NY Bight project within 62 miles (100 kilometers) of the Brigantine Wilderness Area.

The CAA amendments (42 USC 7401 et seq., Section 328) directed USEPA to establish requirements to control air pollution from the Atlantic OCS. The OCS Air Regulations (40 CFR 55) establish the applicable air pollution control requirements, including provisions related to permitting, monitoring, reporting, fees, compliance, and enforcement for facilities subject to the CAA. These regulations apply to OCS sources that are beyond state seaward boundaries. Projects within 25 nautical miles (46 kilometers) of a state seaward boundary are required to comply with the air quality requirements of the nearest or corresponding onshore area, including applicable permitting requirements.

3.4.1.2 Impact Level Definitions for Air Quality and Greenhouse Gas Emissions

Definitions of adverse impact levels are provided in Table 3.4.1-1. Beneficial impacts on air quality are described using the definitions described in Section 3.3.2 (Table 3.3-1). Impact levels for air quality are

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[1] Figure 3.4.1-1 also indicates the nonattainment area for the 1979 1-hour ozone NAAQS, which USEPA has revoked; however, this area still must meet the provisions of the former State Implementation Plan for the 1-hour ozone standard.

[2] The 100-kilometer distance applies to notification and is not a threshold for use in evaluating impacts. Impacts at Class I areas at distances greater than 100 kilometers may need to be considered for larger emission sources if there is reason to believe that such sources could affect the air quality in the Class I area (USEPA 1992).

intended to serve NEPA purposes only, and are not intended to establish thresholds or other requirements with respect to permitting under the CAA.

Table 3.4.1-1. Adverse impact level definitions for air quality and GHG emissions

Impact Level	Definition
Negligible	Increases in ambient pollutant concentrations due to project emissions would be so small that they would be extremely difficult or impossible to discern or measure.
Minor to Moderate	Increases in ambient pollutant concentrations due to project emissions would be detectable but would not lead to exceedance of the NAAQS.
Major	Increases in ambient pollutant concentrations due to project emissions potentially would lead to exceedance of the NAAQS.

Accidental releases and air emissions are contributing IPFs to impacts on air quality. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.4.1-2.

Table 3.4.1-2. Issues and indicators to assess impacts on air quality and GHG emissions

Issue	Impact Indicator
Compliance with NAAQS	Emissions (U.S. tons per year) during construction, operation, and conceptual decommissioning from marine vessels, vehicles, and equipment activity within 25 miles of the outer edge of the NY Bight lease areas. The significance thresholds for criteria pollutants are the NAAQS.
GHG emissions	GHG emissions (metric tons per year) during construction, operation, and conceptual decommissioning; operational GHG emissions reductions due to displacement of fossil-fuel power plants by wind energy. There are currently no significance thresholds for GHG emissions.

3.4.1.3 Impacts of Alternative A – No Action – Air Quality and Greenhouse Gas Emissions

When analyzing the impacts of the No Action Alternative on air quality, BOEM considered the impacts of past and ongoing trends and activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for air quality. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore-wind and offshore wind activities, which are described in Appendix D, *Planned Activities Scenario*.

3.4.1.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for air quality described in Section 3.4.1.1, *Description of the Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends, and respond to IPFs introduced by other ongoing non-offshore-wind and offshore wind activities. Ongoing non-offshore-wind activities within the geographic analysis area that contribute to impacts on air quality are generally associated with existing onshore land uses, including residential, commercial, industrial, and transportation activities as well as onshore construction activities. Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on air quality include ongoing construction of Ocean Wind 1 (OCS-A 0498) and Empire Wind (OCS-A 0512). Ongoing construction of Ocean Wind 1 and Empire Wind would have the same types of impacts on air quality that are described in Section 3.4.1.3.2, *Cumulative Impacts of the No Action Alternative,* for all ongoing and planned offshore wind activities in the geographic analysis area.

In March 2023, DOE announced the release of its Offshore Wind Energy Strategy, a comprehensive summary of DOE's efforts to meet President Biden's goal[3] to deploy 30 GW of offshore wind energy by 2030 and set the nation on a pathway to 110 GW or more by 2050. In addition, states in the region have developed policies and plans to encourage and develop renewable energy sources in the region, as summarized below.

New York

Power sector trends in New York State indicate that without recent GHG reduction initiatives, the largest shares of total electricity generation would remain natural gas, nuclear, and imported power. With the last coal-fired plants in New York having closed in 2020, future emissions would decrease slightly due to improvements in efficiency (New York State Climate Action Council 2022). Under the No Action Alternative, without implementation of other offshore wind projects, the electricity that would have been generated by offshore wind would likely be provided by a similar mix of generation sources (the "grid mix"), with an increased reliance on solar power and other renewable energy sources to meet New York State's renewable energy goals, as discussed further below (New York State Climate Action Council 2022).

In 2014, Governor Andrew Cuomo launched an energy policy, Reforming the Energy Vision, to build an integrated energy network able to harness the combined benefits of the central grid with clean, locally generated power. The State Energy Plan (New York State 2015) set a roadmap for the Reforming the Energy Vision policy, combining agency coordination, regulatory reform, and measures to encourage private capital investment. The initiatives outlined in the State Energy Plan, along with private sector innovation and investment fueled by Reforming the Energy Vision, were intended to put New York State on a path to achieving the following GHG emissions limits and clean energy goals:

- 40 percent reduction in GHG emissions from 1990 levels.
- 50 percent of energy generation from renewable energy sources.
- 600 trillion British thermal unit–increase in statewide energy efficiency (reduction in energy use through efficiency improvements).

In 2019, the New York State Climate Leadership and Community Protection Act (CLCPA) set an expanded Clean Energy Standard and provided statutory requirements that supersede the Reforming the Energy Vision policy and State Energy Plan goals. The CLCPA requires that 70 percent of New York's electricity come from renewable sources by 2030 and 100 percent of electricity come from zero-emission sources

[3] Executive Order on Tackling the Climate Crisis at Home and Abroad, January 27, 2021.

by 2040. In addition, the CLCPA requires that New York reduce statewide GHG emissions to at least 40 percent below 1990 levels by 2030 and at least 85 percent below 1990 levels by 2050.

Lastly, NYSERDA led the development of the New York State Offshore Wind Master Plan and is leading the coordination of offshore wind opportunities in New York State and supporting the development of 9,000 MW of offshore wind energy by 2035.

New Jersey

The New Jersey Department of Environmental Protection (NJDEP) has projected that under a scenario of continuation of current regulations and policies, emissions from electricity generation would decline slowly through 2050 due to improvements in efficiency and switching to cleaner fuels (NJDEP 2019). Under the No Action Alternative, without implementation of other offshore wind projects, the electricity that would have been generated by offshore wind would likely be provided by fossil fuel-fired facilities.[4] As a result, a continuation of ongoing activities under the No Action Alternative could lead to less decline in emissions than would occur with offshore wind development. An overall mix of natural gas, solar, wind, and energy storage would likely occur in the future due to market forces and state energy policies. New Jersey Executive Order 307 (September 21, 2022) sets a goal of developing 11,000 MW of offshore wind energy off the coast of New Jersey by 2040. The New Jersey Energy Master Plan (New Jersey Board of Public Utilities 2019) sets a goal of transitioning New Jersey to 100 percent renewable electricity by 2050. In addition to electricity generation, emissions from other ongoing activities including vessel and vehicle emissions and accidental releases of fuel or other hazardous material would continue to contribute to ongoing regional air quality impacts.

3.4.1.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the six NY Bight projects).

Planned non-offshore-wind activities that could contribute to air quality impacts include construction of undersea transmission lines and transmission systems, gas pipelines, and other submarine cables; marine minerals use and ocean-dredged material disposal; military use; marine transportation; oil and gas activities; and onshore development activities (Appendix D). These planned non-offshore-wind activities have the potential to affect air quality through their emissions. Impacts associated with climate change could affect ambient air quality through increased formation of ozone and PM associated with increasing air temperatures.

Ongoing and planned offshore wind activities within the geographic analysis area that contribute to impacts on air quality and greenhouse gas emissions are listed in Table 3.4.1-3.

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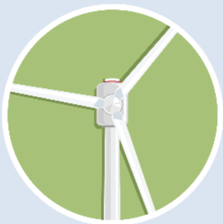
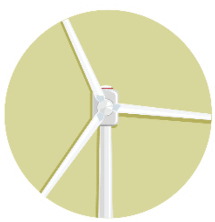
[4] In 2020, the generation mix of the PJM Interconnection, the regional grid that serves New Jersey, was approximately 40 percent natural gas, 34 percent nuclear, 19 percent coal, 3 percent wind, 2 percent hydroelectric, and 2 percent other sources, on an annual average basis (Monitoring Analytics 2021).

Table 3.4.1-3. Ongoing and planned offshore wind in the geographic analysis area for air quality and GHG emissions

Ongoing/Planned	Projects by Region
Ongoing – 3 projects[1] 	**NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 3 projects[2] 	**NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499)

NJ = New Jersey; NY = New York

Note: The 15.5-mile onshore buffer of the air quality geographic analysis area overlaps with a very small portion of the Garden State Offshore Energy (GSOE) I (OCS-A 0482) lease area. BOEM has not included the GSOE I project in the air quality analysis because the overlap is small and it is unlikely any onshore component of the NY Bight projects would be located in the southern part of New Jersey within 15.5 miles of the GSOE I lease area. Additionally, BOEM is including estimated emissions for the complete buildout of the Ocean Wind 1, Ocean Wind 2, and Atlantic Shores South lease areas in the analysis even though only a portion of those lease areas fall within the geographic analysis area (see Figure 3.4.1-1). Therefore, even by excluding the GSOE I project, BOEM's analysis likely overestimates the emissions for the No Action Alternative and the cumulative analysis of air quality impacts.

[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.

[2] Status as of September 20, 2024.

BOEM expects ongoing and planned offshore wind activities to affect air quality through the following primary IPFs.

Air emissions: Most air pollutant emissions and air quality impacts from ongoing and planned offshore wind projects would occur during construction, potentially from multiple projects occurring simultaneously. All projects would be required to obtain an OCS air quality permit from USEPA and to comply with any other applicable requirements of the CAA. Primary emission sources would include increased public and commercial vehicular traffic, air traffic, combustion emissions from construction equipment, and fugitive particle emissions from construction-generated dust. As wind energy projects come online, power generation emissions overall could decrease, and the region as a whole could realize a net benefit to air quality.

The ongoing and planned offshore wind projects that may result in air pollutant emissions and air quality impacts within the air quality geographic analysis area would produce an estimated 9,561 MW of renewable power from the installation of 697 WTGs (Appendix D, Table D2-1). Based on the assumed offshore construction schedule in Appendix D, Table D2-1, those projects within the geographic analysis area would have overlapping construction periods beginning in 2024 and continuing through 2030.

During the construction phase, the total emissions of criteria pollutants and O_3 precursors from offshore wind projects other than the NY Bight projects proposed within the air quality geographic analysis area, summed over all construction years, are estimated to be 11,582 tons of CO, 47,127 tons of NO_X, 1,501 tons of PM_{10}, 1,361 tons of $PM_{2.5}$, 635 tons of SO_2, 1,811 tons of VOCs, and 3,043,329 tons of carbon dioxide (CO_2) (Appendix D, Table D2-4). Most emissions would occur from diesel-fueled construction equipment, vessels, and commercial vehicles. The magnitude of the emissions and the resulting air quality impacts would vary spatially and temporally during the construction phases. Construction activity would occur at different locations and could overlap temporally with activities at other locations, including operational activities at previously constructed projects. As a result, air quality impacts would be minor to moderate, shifting spatially and temporally across the air quality geographic analysis area. Conceptual decommissioning would involve vessels and equipment similar to those used for construction, and impacts of conceptual decommissioning are expected to be similar to the impacts of construction.

During operations, emissions from offshore wind projects within the air quality geographic analysis area would overlap temporally, but operations would contribute few criteria pollutant emissions compared to construction and conceptual decommissioning. Operational emissions would come largely from commercial vessel traffic and emergency diesel generators. The aggregate operational emissions for all projects within the air quality analysis area would vary by year as successive projects begin operation. Estimated operational emissions would be 228–694 tons per year of CO, 479–1,963 tons per year of NO_X, 13–60 tons per year of PM_{10}, 12–55 tons per year of $PM_{2.5}$, 7–17 tons per year of SO_2, 21–59 tons per year of VOCs, and 45,918–159,045 tons per year of CO_2 (Appendix D, Table D2-4)[5]. Cumulatively, operational emissions would result in negligible air quality impacts because emissions would be intermittent, localized, and dispersed throughout the lease areas and vessel routes from the onshore O&M facilities.

Offshore wind energy development could help reduce emissions from onshore energy sources, potentially improving regional air quality and reducing GHGs. Millstein et al. (2018) estimated that between 2007 and 2015, wind power in the U.S. avoided as much as 127,698,000 metric tons (MT) of CO_2 per year, 147,000 MT of SO_2 per year, 93,000 MT of NO_X per year, and 9,000 MT of $PM_{2.5}$ per year. A study by DOE estimated emissions for a future scenario with wind energy supplying 10 percent of total U.S. electricity demand by 2020, 20 percent by 2030, and 35 percent by 2050. The study estimated cumulative emissions reductions from 2013 to 2050 of 2.6 million MT of SO_2, 4.7 million MT of NO_X, and 0.5 million MT of $PM_{2.5}$ (DOE 2015). Similarly, the study scenario was estimated to reduce GHG emissions in the electric sector by 130 million MT of CO_2 equivalent (CO_2e) in 2020, 380 million MT CO_2e in 2030, and 510 million MT CO_2e in 2050 (DOE 2015).

An analysis by Barthelmie and Pryor (2021) calculated that, depending on global trends in GHG emissions and the amount of wind energy expansion, development of wind energy could reduce

[5] Aggregate operational emissions do not include operational emissions from Atlantic Shores North, as such emissions are not available in Appendix D, Table D2-4.

predicted increases in global surface temperature by 0.5–1.4 degrees Fahrenheit (°F) (0.3–0.8 degrees Celsius [°C]) by 2100.

Estimations and evaluations of potential health and climate benefits from offshore wind activities for specific regions and project sizes rely on information about the air pollutant emission contributions of the existing and projected mixes of power generation sources, and generally estimate the annual health benefits of an individual commercial scale offshore wind project to be valued in the hundreds of millions of dollars (Kempton et al. 2005; Buonocoure et al. 2016).

The potential health benefits of avoided emissions can be evaluated using USEPA's CO-Benefits Risk Assessment (COBRA) health impacts screening and mapping tool (USEPA 2020a). COBRA is a tool that estimates the health and economic benefits of clean energy policies. For example, COBRA was used to analyze the avoided emissions that were calculated for development of 8.6 GW of reasonably foreseeable wind power on the OCS. Table 3.4.1-4 presents the estimated monetized health benefits and avoided mortality for this example scenario.

Table 3.4.1-4. COBRA estimate of annual avoided health effects with 8.6 GW reasonably foreseeable offshore wind power

Discount Rate[1] (2023)	Monetized Total Health Benefits (million U.S. dollars/year)		Avoided Mortality (cases/year)	
	Low Estimate[2]	High Estimate[2]	Low Estimate[2]	High Estimate[2]
3%	$288	$649	25.868	58.534
7%	$252	$571	25.868	58.534

[1] The discount rate is used to express future economic values in present terms. Not all health effects and associated economic values occur in the year of analysis. Therefore, COBRA accounts for the "time value of money" preference (i.e., a general preference for receiving economic benefits now rather than later) by discounting benefits received later (USEPA 2020b).
[2] The low and high estimates are derived using two sets of assumptions about the sensitivity of adult mortality and non-fatal heart attacks to changes in ambient $PM_{2.5}$ levels. Specifically, the high estimates are based on studies that estimated a larger effect of changes in ambient $PM_{2.5}$ levels on the incidence of these health effects (USEPA 2020b).

BOEM anticipates that the air quality impacts associated with ongoing and planned offshore wind activities in the geographic analysis area would result in minor to moderate adverse impacts due to emissions of criteria pollutants, VOCs, HAPs, and GHGs, mostly released during construction and conceptual decommissioning. Impacts would be minor to moderate because these emissions would increase ambient pollutant concentrations, though not by enough to cause a violation of the NAAQS, New Jersey AAQS, or New York AAQS. Offshore wind projects likely would lead to reduced emissions from fossil-fuel power plants and consequently minor to moderate beneficial impacts on air quality (see Table 3.3-1 for definitions of beneficial impacts).

Construction and operation of ongoing and planned offshore wind projects would produce GHG emissions that would contribute to climate change. CO_2 is relatively stable in the atmosphere and, for the most part, mixed uniformly throughout the troposphere and stratosphere. As such, the impact of GHG emissions does not depend upon the source location. Increasing energy production from offshore wind projects could reduce regional GHG emissions by displacing energy from fossil fuels. The amount of emissions reduction from displaced generation is uncertain because the future grid mix is not known. This reduction would likely more than offset the relatively small GHG emissions from offshore wind projects. This reduction in regional GHG emissions would be noticeable in the regional context and contribute to addressing climate change, and would represent a minor to moderate beneficial impact in the regional context but a negligible beneficial impact in the global context (see Table 3.3-1 for definitions of beneficial impacts).

Accidental releases: Ongoing and planned offshore wind activities could release air toxics or HAPs because of accidental chemical spills within the air quality geographic analysis area. Section 3.4.2, *Water Quality*, includes a discussion of the nature of releases anticipated. Based on Appendix D, Table D2-3, up to about 2,022,116 gallons (7.7 million liters) of coolants, 4,583,097 gallons (17.3 million liters) of oils and lubricants, and 743,373 (2.8 million liters) of diesel fuel would be contained in the 738 wind turbine and substation structures for the wind energy projects within the air quality geographic analysis area. If accidental releases occur, they would be most likely during construction but could occur during operations and conceptual decommissioning of offshore wind facilities. These may lead to short-term periods (hours to days)[6] of HAPs emissions through surface evaporation. HAPs emissions would consist of VOCs, which are important for O_3 formation. By comparison, the smallest tanker vessel operating in these waters (a general-purpose tanker) has a capacity of between 3.2 and 8 million gallons (12.1 million and 30.3 million liters). Tankers are relatively common in these waters, and the total WTG chemical storage capacity within the geographic analysis area for air quality is much less than the volume of hazardous liquids transported by ongoing activities (U.S. Energy Information Administration 2014). BOEM expects air quality impacts from accidental releases would be negligible because impacts would be short term and limited to the area near the accidental release location. Accidental spills would occur infrequently over a 35-year period with a higher probability of spills during future project construction, but they would not be expected to contribute appreciably to cumulative impacts on air quality.

3.4.1.3.3 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, air quality would continue to be affected by existing environmental trends and ongoing activities. More, higher-emitting, fossil-fuel power plants would be kept in service to meet future power demand under the No Action Alternative compared to the action alternatives. These impacts would be partially mitigated once the approved Ocean Wind 1 offshore wind project is operational. BOEM expects ongoing offshore wind and non-offshore-wind activities would continue to have regional air quality impacts primarily through air pollutant emissions, accidental releases, and climate change. BOEM anticipates that ongoing activities would likely result in **moderate** impacts on air quality because of air pollutant emissions and GHGs.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, air quality would continue to be affected by natural and human-caused IPFs. Planned non-offshore-wind activities may also contribute to impacts on air quality because air pollutant and GHG emissions would increase through construction and operation of new energy generation facilities to meet future power demands. Continuation of current regional trends in energy development could include new power plants that

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[6] For example, small diesel fuel spills (500–5,000 gallons) usually will evaporate and disperse within a day or less (NOAA 2006).

could contribute to air quality and GHG impacts in New York, New Jersey, and the neighboring states. BOEM expects the combination of ongoing and planned activities other than offshore wind to result in **moderate** impacts on air quality, primarily driven by recent market and permitting trends indicating future fossil-fueled electric generating units would most likely include natural-gas-fired facilities (BOEM 2017a; BOEM 2021).

Offshore wind activities in the geographic analysis area would contribute to the emissions of criteria pollutants, VOCs, HAPs, and GHGs, mostly released during construction and conceptual decommissioning. Impacts would be minor to moderate because these emissions would increase ambient pollutant concentrations, though not by enough to cause a violation of the NAAQS, New Jersey AAQS, or New York AAQS or contribute substantially to an existing violation. Pollutant emissions during operations would be generally lower and more transient. Most air pollutant emissions and air quality impacts would occur during multiple overlapping project construction phases from 2024 through 2030 (Appendix D, Table D2-4). Overall, adverse air quality impacts from offshore wind projects are expected to be relatively small and transient. Offshore wind projects likely would lead to reduced emissions from fossil-fuel power plants and consequently **minor** to **moderate beneficial** impacts on regional air quality after offshore wind projects are operational.

BOEM anticipates that the cumulative impacts of the No Action Alternative would likely result in **moderate** impacts due to emissions of criteria pollutants, VOCs, and HAPs, mostly released during construction and conceptual decommissioning. Impacts would be **moderate** because these emissions would increase ambient pollutant concentrations (more than would activities without offshore wind or offshore wind alone), though not by enough to cause a violation of the NAAQS, New Jersey AAQS, or New York AAQS or contribute substantially to an existing violation.

3.4.1.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Air Quality and Greenhouse Gas Emissions

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

3.4.1.4.1 Impacts of One Project

A single NY Bight project may generate emissions and affect air quality in the New York-New Jersey region and nearby coastal waters during construction and installation, O&M, and conceptual decommissioning activities. Onshore emissions would occur in the onshore export cable corridors and at POIs. Offshore emissions would be released over the OCS and state waters. Offshore emissions would occur in any one of the six NY Bight lease areas and the offshore export cable corridors.

The emissions estimates in this section do not include emissions from raw material extraction, materials processing, and manufacturing of components, i.e., full life-cycle analysis. However, recently published studies have analyzed the life-cycle impacts of offshore wind (Ferraz de Paula and Carmo 2022; Rueda-Bayona et al. 2022; Shoaib 2022). These studies concluded that the materials that have the greatest impact on life-cycle emissions generally are steel and concrete, and that materials recycling rates have a large influence on life-cycle emissions. The National Renewable Energy Laboratory (NREL) harmonized approximately 3,000 life cycle assessment studies with around 240 published life-cycle analyses of land-based and offshore wind technologies (NREL 2021). Though wind has higher upstream emissions than many other generation methods, its life-cycle GHG emissions are orders of magnitude lower. NREL (2021) estimated that the central 50 percent of GHG estimates reviewed were in the range of 9.4–14 grams of CO_2e per kilowatt-hour (g CO_2-eq/kWh) while life-cycle GHG estimates for coal and natural gas are on the scale of 1,000 grams CO_2-eq/kWh (Dolan and Heath 2012) and 480 grams CO_2-eq/kWh (O'Donoughue et al. 2014), respectively.

One NY Bight project would provide beneficial impacts on the air quality near the proposed location and the surrounding region to the extent that energy produced by that one project would displace energy produced by fossil-fuel power plants.

Air emissions – construction: Fuel combustion and solvent use would cause construction-related emissions. The air pollutants would include criteria pollutants, VOCs, and HAPs, as well as GHGs. During the construction phase, the activities of additional workers, increased traffic congestion, additional commuting miles for construction personnel, and increased air-polluting activities of supporting businesses also could have impacts on air quality. BOEM used its Wind Tool model (BOEM 2017b) to estimate the construction emissions for a single NY Bight project based on a maximum-case scenario (280 WTGs and 5 OSSs) of the RPDE. The total estimated construction emissions of each pollutant are summarized in Table 3.4.1-5. BOEM assumes that construction of a NY Bight project would start in 2026 at the earliest. The duration of construction for a single NY Bight project is anticipated to occur during the period of 2026–2030, and possibly beyond.

Table 3.4.1-5. Total construction emissions (U.S. tons, except GHGs in metric tons) for a single NY Bight project

Period	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2	CH_4	N_2O	CO_2e
Total	5,555	26,104	527	504	1,014	755	1,533,965	10	75	1,556,503

CH_4 = methane; CO_2e = carbon dioxide equivalent; N_2O = nitrous oxide
CO_2e values were calculated using the 100-year Global Warming Potential (GWP) values from the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (Forster et al. 2007).

Offshore Construction

Emissions from potential sources or construction activities would vary throughout the construction and installation of offshore components. Emissions from offshore activities would occur during pile and scour protection installation, offshore cable laying, turbine installation, and substation/converter station installation. Offshore construction-related emissions also would come from diesel-fueled generators used to temporarily supply power to the WTGs and substation/converter stations so that workers could operate lights, controls, and other equipment before cabling is in place. There also would be emissions from engines used to power pile-driving hammers and air compressors used to supply compressed air to noise-mitigation devices during pile-driving (if used). Emissions from vessels and helicopters used to transport workers, supplies, and equipment to and from the construction areas would result in additional air quality impacts. A NY Bight project may need to use emergency generators at times, potentially resulting in increased emissions for limited periods.

Air quality impacts due to a single NY Bight project within the air quality geographic analysis area are anticipated to be small relative to larger emission sources such as fossil-fuel power plants.[7] The largest air quality impacts are anticipated during construction, with smaller and more infrequent impacts anticipated during conceptual decommissioning.

The majority of air pollutant and GHG emissions from a single NY Bight project alone would come from the main engines, auxiliary engines, and auxiliary equipment on marine vessels used during offshore construction activities. Emissions from the OCS source, as defined in the CAA, would be allowed as part of the OCS permit for which each project must apply. A NY Bight project must demonstrate compliance with the NAAQS and must demonstrate no adverse impact on air quality–related values. The OCS air permitting process includes air dispersion modeling of emissions to demonstrate compliance with the NAAQS. As part of the air quality–related values analysis, a NY Bight project must demonstrate that significant visibility degradation at a Class I area would not occur as a result of increased haze or plumes.

Onshore Construction

Onshore activities of a NY Bight project would consist primarily of tunneling/drilling/excavation for cable installation, duct bank construction, cable-pulling operations, and substation or converter station construction. Emissions would be primarily from operation of diesel-powered equipment and vehicle activity such as bulldozers, excavators, and diesel trucks, and fugitive particulate emissions from excavation and hauling of soil.

These emissions would be highly variable and limited in spatial extent at any given period and would result in minor to moderate impacts (less than the NAAQS), as they would be temporary in nature. Fugitive particulate emissions would vary depending on the spatial extent of the excavated areas, soil type, soil moisture content, and magnitude and direction of ground-level winds.

Air emissions – O&M: During O&M, air quality impacts are anticipated to be smaller in magnitude compared to construction and conceptual decommissioning. Offshore O&M activities would consist of WTG operations, planned maintenance, and unplanned emergency maintenance and repairs. The WTGs operating would have no pollutant emissions. The WTGs are not anticipated to include permanently installed emergency generators; however, a temporary backup diesel generator may be installed at a turbine during the commissioning phase until the grid connection is made. Emergency generators on the substations/converter stations would operate only during emergencies or testing, so emissions from these sources would be small and transient. Pollutant emissions from O&M would be mostly the result of operations of ocean vessels and helicopters used for maintenance activities. Crew transfer vessels and helicopters would transport crews to the NY Bight offshore project area for inspections, routine

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[7] For example, the annual operational emissions from a single NY Bight project would represent the following percentages of the emissions from fossil-fuel power plants in New Jersey, based on the USEPA 2020 National Emissions Inventory (USEPA 2023): CO 2%; NO_X 7%; PM_{10}, $PM_{2.5}$, and SO_2 less than 1% each; and VOC less than 2%.

maintenance, and repairs. Jack-up vessels, multipurpose offshore support vessels, and rock-dumping vessels would travel infrequently to the NY Bight offshore project area for significant maintenance and repairs. The annual estimated emissions for O&M of one NY Bight project are summarized in Table 3.4.1-6.

Table 3.4.1-6. Operations and maintenance (O&M) emissions (U.S. tons, except GHGs in metric tons) from a single NY Bight project

Period	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2	CH_4	N_2O	CO_2e
Annual	52	227	5	4	9	5	12,505	0.1	0.6	13,971
Operating Lifetime (35 years)	1,810	7,928	159	154	308	186	437,688	4	21	488,998

CH_4 = methane; CO_2e = carbon dioxide equivalent; N_2O = nitrous oxide
CO_2e values were calculated using the 100-year GWP values from the IPCC's Fourth Assessment Report (Forster et al. 2007).

If one NY Bight project were to use switchgear containing the GHG SF_6, then additional GHG emissions could occur from leakage of SF_6 from switchgear. SF_6 is a synthetic gas that has been used as an anti-arcing insulator in electrical systems for approximately 70 years. It is a dense gas and a potent GHG, with an environmental lifespan of thousands of years. There are international efforts to minimize and eventually phase out the production and use of this gas. Potential emissions of SF_6 are not shown in Table 3.4.1-6 because it is unknown whether SF_6 would be used. Based on other projects, if SF_6 were used in all project switchgear then the total quantity of SF_6 contained in project switchgear could be about 66,400 pounds (30,100 kilograms). At an assumed leakage rate of 0.5 percent per year, the GHG emissions from this quantity of SF_6 would be 3,431 metric tons of CO_2e per year. However, this is a conservative assumption because SF_6 may not be used.

Depending on the wind conditions at the time of emissions, it is likely that not all emissions generated offshore would reach land. BOEM anticipates that air quality impacts from O&M of one NY Bight project would be minor (less than the NAAQS), occurring for short periods of time several times per year during the estimated 35 years of activity.

Emissions from onshore O&M activities would be limited to periodic use of construction vehicles and equipment. Onshore O&M activities would include occasional inspections and repairs to onshore substations/converter stations and splice vaults, which would require minimal use of worker vehicles and construction equipment. BOEM anticipates that air quality impacts due to onshore O&M from one NY Bight project would be minor, intermittent, and occurring for short periods.

Increases in renewable energy could lead to reductions in emissions from fossil-fuel power plants. BOEM used its Wind Tool (BOEM 2017b) to estimate the emissions avoided as a result of a NY Bight project. Once operational, the 280 WTGs from a single NY Bight project would result in annual avoided emissions of 1,818 tons of NO_X, 268 tons of $PM_{2.5}$, 999 tons of SO_2, and 5,414,326 metric tons of CO_2. The avoided CO_2 emissions are equivalent to the emissions generated by about 1,200,000 passenger vehicles in a year (USEPA 2020c). Accounting for construction emissions and assuming conceptual decommissioning emissions would be the same, and including emissions from future operations, a single NY Bight project would offset emissions related to its construction and conceptual decommissioning within different time periods of operation depending on the pollutant: NO_X would be offset in approximately 28 years of operation, $PM_{2.5}$ in 4 years, SO_2 in 2 years, and CO_2 in 7 months. If emissions from future operations and conceptual decommissioning were not included, the times required for emissions to "break even" would be shorter. From that point, one NY Bight project would have lower emissions that otherwise might be generated from another fossil fuel source.

The potential health benefits of avoided emissions can be evaluated using USEPA's COBRA health impacts screening and mapping tool as discussed in Section 3.4.1.3.2, *Cumulative Impacts of the No Action Alternative*. COBRA was used to analyze the avoided emissions that were calculated for a NY Bight project. Table 3.4.1-7 presents the results.

Table 3.4.1-7. COBRA estimate of annual avoided health effects with a single NY Bight project

Discount Rate[1] (2023)	Monetized Total Health Benefits (million U.S. dollars/year)		Avoided Mortality (cases/year)	
	Low Estimate[2]	High Estimate[2]	Low Estimate[2]	High Estimate[2]
3%	$149	$337	13.416	30.358
7%	$131	$296	13.416	30.358

[1] The discount rate is used to express future economic values in present terms. Not all health effects and associated economic values occur in the year of analysis. Therefore, COBRA accounts for the "time value of money" preference (i.e., a general preference for receiving economic benefits now rather than later) by discounting benefits received later (USEPA 2020b).
[2] The low and high estimates are derived using two sets of assumptions about the sensitivity of adult mortality and non-fatal heart attacks to changes in ambient $PM_{2.5}$ levels. Specifically, the high estimates are based on studies that estimated a larger effect of changes in ambient $PM_{2.5}$ levels on the incidence of these health effects (USEPA 2020b).

The overall impacts of GHG emissions can be assessed using "social costs." The "social cost of carbon," "social cost of nitrous oxide," and "social cost of methane"—together, the "social cost of greenhouse gases" (SC-GHG)—are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year. NEPA does not require monetizing costs and benefits but allows the use of the social cost of carbon, SC-GHG, or other monetized costs and benefits of GHGs in weighing the merits and drawbacks of alternative actions. In January 2023, CEQ issued interim guidance (CEQ 2023) that updated and reinstated its 2016 guidance document (CEQ 2016) on consideration of GHGs and climate change under NEPA. The interim guidance recommends that agencies provide context for GHG emissions, including through the use of SC-GHG estimates, to translate climate impacts into the more accessible metric of dollars.

For federal agencies, the best currently available estimates of SC-GHG are the interim estimates of the social costs of CO_2, methane (CH_4), and nitrous oxide (N_2O) developed by the Interagency Working Group (IWG) on SC-GHG and published in its Technical Support Document (IWG 2021). IWG's SC-GHG estimates are based on complex models describing how GHG emissions affect global temperatures, sea level rise, and other biophysical processes; how these changes affect society through, for example, agricultural, health, or other effects; and monetary estimates of the market and nonmarket values of these effects. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damages associated with emissions in a particular year. The discount rate accounts for the "time value of money," i.e., a general preference for receiving economic benefits now rather than later, by discounting benefits received later. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are less valuable or are a less significant factor in present-day decisions). IWG developed the current set of interim estimates of SC-GHG using three different annual discount rates: 2.5 percent, 3 percent, and 5 percent (IWG 2021).

There are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

To further address uncertainty, IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of damages estimated, applying a 3 percent annual discount rate for future economic effects. This is a low-probability but high-damage scenario and represents an upper bound of damages within the 3 percent discount rate model. The estimates below follow the IWG recommendations.

Table 3.4.1-8 presents the SC-GHG associated with estimated emissions from a single NY Bight project. These estimates represent the present value of future market and nonmarket costs associated with CO_2, methane, and nitrous oxide emissions. In accordance with IWG's recommendation, four estimates were calculated based on IWG estimates of social cost per metric ton of emissions for a given emissions year and estimates of emissions from one NY Bight project in each year. In Table 3.4.1-8, negative values represent social benefits of avoided GHG emissions. The negative values for net SC-GHG indicate that the impact of one NY Bight project on GHG emissions and climate would be a net benefit in terms of SC-GHG.

Table 3.4.1-8. Estimated social cost of GHGs associated with a single NY Bight project

Description	Social Cost of GHGs (2020$)[1,2]			
	Average Value, 5% Discount Rate	Average Value, 3% Discount Rate	Average Value, 2.5% Discount Rate	95th Percentile Value, 3% Discount Rate
SC-CO_2				
Construction, Operation, and Conceptual Decommissioning	$34,033,000	$141,232,000	$219,195,000	$428,483,000
Avoided Emissions	-1,772,701,000	-7,652,784,000	-11,928,208,000	-23,421,568,000
Net SCC- CO_2	-1,738,668,000	-7,511,552,000	-11,709,013,000	-22,993,085,000

Description	Social Cost of GHGs (2020$)[1,2]			
	Average Value, 5% Discount Rate	Average Value, 3% Discount Rate	Average Value, 2.5% Discount Rate	95th Percentile Value, 3% Discount Rate
SC-CH_4				
Construction, Operation, and Conceptual Decommissioning	$11,000	$31,000	$43,000	$82,000
Avoided Emissions	-7,379,000	-21,843,000	-30,449,000	-58,202,000
Net SCC-CH_4	-7,368,000	-21,812,000	-30,406,000	-58,120,000
SC-N_2O				
Construction, Operation, and Conceptual Decommissioning	$668,000	$2,582,000	$3,992,000	$6,860,000
Avoided Emissions	-8,598,000	-34,635,000	-53,797,000	-92,390,000
Net SCC-N_2O	-7,930,000	-32,053,000	-49,805,000	-85,530,000
Total SC-GHG[3]				
Construction, Operation, and Conceptual Decommissioning	$34,712,000	$143,845,000	$223,230,000	$435,425,000
Avoided Emissions	-1,788,678,000	-7,709,262,000	-12,012,454,000	-23,572,160,000
Net SC-GHG	-1,753,966,000	-7,565,417,000	-11,789,224,000	-23,136,735,000

[1] The following calendar years were assumed in calculating SC-GHG: construction 2026–2028, operation (35 years) 2029–2064, and decommissioning 2065–2067.
[2] Negative cost values indicate benefits.
[3] SC-GHG is the sum of the social costs for CO_2, CH_4, and N_2O.
Estimates are over the lifetime of a single NY Bight project. Estimates are rounded to the nearest $1,000.

Table 3.4.1-9 presents the annual emissions, avoided emissions, and net emissions of CO_2 over the operational lifetime of a single NY Bight project. Net emissions are the NY Bight project emissions minus the avoided emissions. The lifetime net emissions for the No Action Alternative (which has no avoided emissions) represents the amount of emissions that would occur from the grid (as configured in 2018) to produce the same quantity of electrical energy as would have been produced by one NY Bight project. The No Action Alternative would result in no emissions during construction and O&M because no project would be built, but would also offer no avoided emissions, resulting in higher GHG emissions over the project duration due to not displacing fossil-fueled power generation via offshore wind. The emissions not avoided, 5,414,326 MT per year of CO_2 (Table 3.4.1-9), would be equivalent to about 1,200,000 additional passenger vehicles per year. These estimates are relative to the 2018 grid configuration as noted, but the actual annual quantity of avoided emissions attributable to this proposed facility is expected to diminish over time if the electric grid becomes lower-emitting due to the addition of other renewable energy facilities and retirement of high-emitting generators.

Table 3.4.1-9. Net emissions of CO_2 for a single NY Bight project

Alternative	CO_2 Emissions (metric tons)[1,2]					
	Construction	Operation				Construction + Operation
	Construction (Total)	O&M Emissions (Annual)	Avoided Emissions (Annual)	Net Emissions (Annual)	Operational Lifetime Net Emissions (Total)	Total Lifetime Net Emissions
No Action	0	0	0	0	0	189,501,413 [3]
One NY Bight Project	1,533,965	13,785	-5,414,326	-5,400,541	-189,018,942	-187,484,977

[1] Positive values are emissions increases; negative values are emissions decreases.

[2] Emissions from decommissioning are not included.

[3] Represents emissions from the grid in the absence of one NY Bight project.

One NY Bight project would produce GHG emissions that contribute to climate change; however, its contribution would be less than the emissions reductions from fossil-fueled sources during operation of the NY Bight project. Because GHG emissions disperse and mix within the troposphere, the climatic impact of GHG emissions does not depend upon the source location. Therefore, regional climate impacts are largely a function of global emissions. Nevertheless, a single NY Bight project would have an overall net beneficial impact on criteria pollutant and O_3 precursor emissions as well as GHGs, compared to a similarly sized fossil-fuel power plant or to the generation of the same amount of energy by the existing grid.

Climate change can make ecosystems, resources, and communities more susceptible as well as lessen resilience to other environmental impacts apart from climate change. In some instances, this may exacerbate the environmental effects of a project. Although one NY Bight project would produce criteria pollutant emissions, the predicted impacts would be within applicable standards and would be unlikely to contribute substantially to increasing susceptibility or decreasing resilience of ecosystems. Similarly, foreseeable climate change would be unlikely to contribute substantially to increasing the impacts of criteria pollutant emissions from a single NY Bight project.

Air emissions – decommissioning: At the end of the operational lifetime of one NY Bight project, the lessee would decommission the project's facilities. All structures above the seabed level or aboveground would be completely removed. The dismantling and removal of the turbine components (blades, nacelle, and tower) and other offshore components would largely be a "reverse installation" process subject to the same constraints as the original construction phase. Onshore conceptual decommissioning activities would include removal of facilities and equipment and restoration of the sites to pre-project conditions where warranted. Emissions from conceptual decommissioning of a single NY Bight project were not quantified but are expected to be less than for construction. One NY Bight project likely would pursue a separate OCS Air Permit for those activities because it might assume that marine vessels, equipment, and construction technology will change substantially in the next 35 years and in the future will have lower emissions than current vessels and equipment. BOEM anticipates minor and temporary air quality impacts from a single NY Bight project due to conceptual decommissioning.

Accidental releases: One NY Bight project could release VOCs or HAPs because of accidental chemical spills. Accidental releases—including spills from vessel collisions and allisions—may lead to short-term periods of VOC and HAP emissions through evaporation. VOC emissions also would be a precursor to O_3 formation. Air quality impacts would be short term and limited to the local area at and around the accidental release location. BOEM anticipates that a major spill is very unlikely due to vessel and offshore wind energy industry safety measures, as discussed in Section 3.4.2, *Water Quality*, as well as the distributed nature of the material. BOEM anticipates that these activities would have a negligible air quality impact as a result of one NY Bight project.

Similarly, a catastrophic failure of switchgear could release SF_6. Such a failure would be extremely unlikely and no such release is expected. Even if all of the SF_6 from all project switchgear were released, the contribution of GHGs to the atmosphere would be negligible relative to the avoided GHG emissions associated with project operation.

3.4.1.4.2 Impacts of Six Projects

With six NY Bight projects, the total emissions and SC-GHG described for a single NY Bight project would be multiplied by as much as six.[8] BOEM anticipates that air quality impacts from construction, operation, and conceptual decommissioning of six NY Bight projects would be minor to moderate (i.e., would not cause an exceedance of the NAAQS). However, to the extent that project activities overlap, impacts at any particular time or place could be greater than for one NY Bight project. If projects do not overlap, then impacts may not be greater in degree than for one NY Bight project but would occur over a longer time or larger area.

Air emissions – construction: As with one NY Bight project, BOEM assumes that construction of six NY Bight projects would start in 2026 at the earliest. The offshore and onshore construction activities for six NY Bight projects would be of the same types as described for one NY Bight project. However, the estimated construction emissions given in Table 3.4.1-5 for a single NY Bight project would be multiplied by as much as six with six NY Bight projects. Construction and operation of six NY Bight projects could overlap in time, and potentially in space if common port facilities or cable corridors are used. Several factors could influence the amount of overlap, such as availability of vessels and port facilities and the rate of progress of baseline surveys. As with one NY Bight project, most emissions with six NY Bight projects would occur from diesel-fueled construction equipment, vessels, and commercial vehicles. The magnitude of the emissions and the resulting air quality impacts would vary spatially and temporally during the construction phases.

Air emissions – O&M: The types of O&M activities, vessels, and equipment with six NY Bight projects would be the same as those for one NY Bight project. However, with six NY Bight projects, the O&M emissions and SC-GHG described for one NY Bight project would be multiplied by as much as six. As with

[8] As indicated in Section 2.1.2.2, the number of WTGs in the six NY Bight lease areas is expected to be less than 1,680 (280 WTGs multiplied by 6 projects). However, in the interest of capturing the highest amount of potential emissions, this section describes emission estimates as being as much as six times greater than a single NY Bight project. Therefore, this analysis likely overstates total emissions and impacts for six NY Bight projects.

a single NY Bight project, the air quality impacts during O&M are anticipated to be smaller in magnitude compared to construction and conceptual decommissioning.

Increases in renewable energy could lead to reductions in emissions from fossil-fuel power plants. Emissions avoided with six NY Bight projects would be greater than with a single NY Bight project. The amount of energy contributed to the grid with six NY Bight projects could be large enough to affect electricity pricing, which could influence decisions by power plant operators to reduce output or take plants offline in response, to a greater degree than with a single NY Bight project.

The potential health benefits of avoided emissions with six NY Bight projects would be greater than with one NY Bight project. As well, the SC-GHG with six NY Bight projects would indicate greater social benefits than with one NY Bight project. Six NY Bight projects would have negligible impacts on climate change and an overall net beneficial impact on criteria pollutant and O_3 precursor emissions as well as GHGs, compared to the generation of the same amount of energy by the existing grid. Based on the avoided GHG emissions described for a single NY Bight project, operation of six NY Bight projects would result in annual avoided emissions of 10,908 tons of NO_X, 1,608 tons of $PM_{2.5}$, 5,994 tons of SO_2, and 32,485,956 metric tons of CO_2 per year.

Air emissions – decommissioning: As with one NY Bight project, BOEM anticipates that each of the six NY Bight projects would pursue a separate OCS Air Permit for decommissioning activities because it is assumed that marine vessels, equipment, and construction technology will change substantially in the next 35 years and in the future will have lower emissions than current vessels and equipment. BOEM anticipates minor and temporary air quality impacts from six NY Bight projects due to conceptual decommissioning.

Accidental releases: Six NY Bight projects could release VOCs or HAPs because of accidental chemical spills, although the potential volume and number of spills would be greater. As with a single NY Bight project, air quality impacts would be short term and limited to the local area at and around the accidental release location. BOEM anticipates that these activities would have a negligible air quality impact as a result of six NY Bight projects.

3.4.1.4.3 Cumulative Impacts of Alternative B

The analysis of cumulative impacts of six NY Bight projects considered the impacts of six NY Bight projects in combination with other ongoing and planned activities. The OCS permit application for each of the six NY Bight projects, which BOEM anticipates the lessees will file after the COPs are submitted and this PEIS is finalized, will give some indication of impacts, but the analysis in those applications would be focused on each individual project. To accurately assess cumulative impacts, a more comprehensive modeling study would be required. BOEM is considering conducting or participating in a regional modeling study that would assess development impacts of six NY Bight projects along with other planned and reasonably foreseeable projects.

Air emissions – construction: Six NY Bight projects would contribute a noticeable addition to the cumulative impacts on air quality associated with offshore construction, which would be moderate during construction. Impacts would be greatest during overlapping construction activities, but these effects would be short term in nature because supply chain demand and vessel availability are limiting factors of the construction of six NY Bight projects in the geographic analysis area. Six NY Bight projects would contribute a noticeable addition to cumulative air quality impacts associated with onshore construction, which would be minor to moderate.

Air emissions – O&M: O&M of six NY Bight projects would contribute a noticeable addition to cumulative impacts, which would be moderate. O&M emissions from ongoing and planned activities, including six NY Bight projects, could begin between 2026 and 2030. Some emissions associated with O&M activities of six NY Bight projects could overlap with offshore and non-offshore-wind construction-related emissions. Six NY Bight projects would also contribute a noticeable addition to the cumulative GHG impacts on air quality, which would be beneficial from the net decrease in GHG emissions to the extent that fossil-fuel power plants would reduce operations as a result of increased energy generation from offshore wind projects. The GHG emissions benefits would diminish over time as the grid becomes cleaner and the emissions displaced by wind energy become less (on a per-megawatt-hour basis) than at the time six NY Bight projects would begin operation.

A known impact of offshore wind facilities on meteorological conditions is the wake effect. A WTG extracts energy from the free flow of wind, creating turbulence downstream of the WTG. Under certain conditions, offshore wind farms can also affect temperature and moisture downwind of the facilities. Section B.1.4, *Potential General Impacts of Offshore Wind Facilities on Meteorological Conditions*, in Appendix B provides further information on these effects. For large numbers of WTGs in a single region, these effects can be large enough to have potential local climate impacts. Akhtar et al. (2022) used a high-resolution regional climate model to investigate the impact on the sea surface climate of large-scale offshore wind farms that are proposed for the North Sea. Their results showed local decreases in wind speed, local increases in precipitation, a significant reduction in the air-sea heat fluxes and a local, annual mean net cooling of the lower atmosphere in the wind farm areas. The atmosphere below the hub height showed an increase in temperature, which is on the order of up to 10 percent of the climate change signal at the end of the century, but it is much smaller than the interannual climate variability. In contrast, wind speed changes with wind farms were larger than projected mean wind speed changes due to climate change. Based on the modeling results the authors suggest that the impacts of large clustered offshore wind farms should be considered in climate change impact studies.

Air emissions – decommissioning: Conceptual decommissioning of six NY Bight projects would contribute a noticeable addition to the cumulative air quality impacts, which would represent a moderate impact. Because the emissions related to conceptual decommissioning activities would be widely dispersed and transient, BOEM expects all air quality impacts to occur close to the emitting sources.

Accidental releases: Six NY Bight projects would contribute an undetectable addition to the cumulative accidental release impacts on air quality, which would be negligible due to the short-term nature and localized potential effects. Accidental spills would occur infrequently over the 35-year period with a higher probability of spills during construction of projects.

3.4.1.4.4 Conclusions

Impacts of Alternative B. A single NY Bight project and six NY Bight projects under Alternative B would result in a net decrease in overall emissions (larger decrease for six NY Bight projects than for one NY Bight project) over the region compared to the emissions from conventional fossil-fuel power plants. Although there could be some short-term air quality impacts due to various activities associated with construction and installation, O&M, and conceptual decommissioning, emissions would be relatively small and limited in duration. Alternative B would result in air quality–related health effects avoided in the region due to the reduction in emissions associated with fossil-fuel energy generation. As described above, the impact from air pollutant emissions is anticipated to be minor, and the impact from accidental releases would be negligible. Considering all IPFs together, **minor** to **moderate** air quality impacts would likely be anticipated for a limited time during construction and installation, O&M, and conceptual decommissioning. Six NY Bight projects would have a greater impact than one NY Bight project, but the impact level would remain the same. There would be a **minor beneficial** impact on air quality near the NY Bight area and the surrounding region overall to the extent that the wind energy produced would displace energy produced by fossil-fuel power plants. Six NY Bight projects would have a greater beneficial impact than one NY Bight project, but the impact level would remain the same. Because of the amount of emissions, the fact that emissions would be spread out in time, and the large geographic area over which they would be dispersed (throughout the lease areas and the vessel routes from the onshore facilities), air pollutant concentrations associated with the NY Bight projects are not expected to exceed the NAAQS, New Jersey AAQS, and New York AAQS.

Cumulative Impacts of Alternative B. The impacts contributed by six NY Bight projects to the cumulative impacts on air quality would range from undetectable to noticeable, with noticeable beneficial impacts. BOEM anticipates that the cumulative impacts associated with six NY Bight projects would likely result in **moderate** impacts and **moderate beneficial** impacts. The main driver for this adverse impact rating is emissions related to construction activities increasing commercial vessel traffic, air traffic, and truck and worker vehicle traffic. Combustion emissions from construction equipment, and fugitive emissions, would be higher during overlapping construction activities but short term in nature, as the overlap would be limited in time to the construction period. Therefore, the adverse impact on air quality would likely be **moderate** because, while emissions would increase ambient pollutant concentrations, the concentrations are not expected to exceed the NAAQS, New Jersey AAQS, and New York AAQS.

Six NY Bight projects and other offshore wind projects would benefit air quality in the region surrounding the six NY Bight projects to the extent that energy produced by offshore wind projects would displace energy produced by fossil-fuel power plants. Though the benefit is regional, BOEM anticipates a **moderate beneficial** impact because the magnitude of the potential reduction in emissions from displacing fossil-fuel generated power would be small relative to total energy generation emissions in the area.

At present, there is limited data available on which to base an assessment of six NY Bight projects' cumulative impacts. The cumulative impact rating of **moderate** adverse and **moderate beneficial** is based on the projected emissions levels, the geographic dispersal of the emission sources, existing pollutant concentrations as measured by NJDEP and New York State Department of Environmental Conservation (NYSDEC), regional meteorology, and expected levels of avoided emissions. The available data on offshore wind projects consist primarily of previous EISs for such projects and the modeling studies performed for OCS permit applications to date, which are all for single projects. As noted above, to accurately assess cumulative impacts of six NY Bight projects along with other planned and reasonably foreseeable projects a more comprehensive, regional-scale modeling study would be required. BOEM expects that, over time, air quality modeling studies performed for OCS permits or by review agencies will provide further insight into cumulative air quality impacts.

3.4.1.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Air Quality and Greenhouse Gas Emissions

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development in the NY Bight area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.4.1.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. However, BOEM has not identified any previously applied AMMM measures for air quality, and therefore, the impacts on air quality under Sub-alternative C1 are the same as for Alternative B.

3.4.1.5.2 Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any previously applied AMMM measures for air quality under Alternative C1, and has not identified any AMMM measures under Sub-alternative C2 that were not previously applied. Therefore, the impacts on air quality under Sub-alternative C2 are the same as Sub-alternative C1.

3.4.1.5.3 Conclusions

Impacts of Alternative C. Under Sub-alternative C1, BOEM has not identified any previously applied AMMM measures for air quality. Therefore, impacts under Sub-alternative C1 would be the same as under Alternative B. Under Sub-alternative C2, BOEM has not identified any AMMM measures for air quality that were not previously proposed. Therefore, impacts under Sub-alternative C2 would be the same as under Alternative B and Sub-alternative C1. Under Sub-alternative C1 and Sub-alternative C2, for one NY Bight project and six NY Bight projects, **minor to moderate** air quality impacts would likely be anticipated for a limited time during construction and installation, O&M, and conceptual decommissioning, with **minor beneficial** impacts.

Cumulative Impacts of Alternative C. As with Alternative B, the impacts contributed by six NY Bight projects to the cumulative impacts on air quality with Sub-alternative C1 and Sub-alternative C2 would range from undetectable to noticeable, with noticeable beneficial impacts. BOEM anticipates that under Sub-alternatives C1 and C2 the cumulative impacts associated with six NY Bight projects would likely be **moderate** adverse and **moderate beneficial**. These impact ratings are the same as expected with Alternative B.

3.4.1.6 Recommended Practices for Consideration at the Project-Specific Stage

BOEM is recommending that lessees consider analyzing the RPs in Table 3.4.1-10 to further reduce potential air quality and greenhouse gas emissions impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.4.1-10. Recommended Practices for air quality and greenhouse gas emissions impacts and related benefits

Recommended Practice	Potential Benefit
AQ-1: Use a substitute insulator gas rather than SF_6 in the switchgear and transmission systems, if feasible.	Using a substitute insulator gas rather than SF_6 in the switchgear and transmission systems would reduce potential SF_6 emissions during construction, operations, and decommissioning.
AQ-2: Replace diesel fuel and marine fuel oil with alternative fuels such as natural gas, propane, or hydrogen, to the extent feasible.	Replacing diesel fuel and marine fuel oil with alternative fuels such as natural gas, propane, or hydrogen would reduce criteria air pollutant and GHG emissions during construction, operations, and decommissioning.
AQ-3: Replace combustion engines with zero-emissions technology (e.g., fuel cell-electric or battery-electric), if feasible.	Replacing combustion engines with zero-emissions technology (e.g., fuel cell-electric or battery-electric) would reduce criteria air pollutant and GHG emissions during construction, operations, and decommissioning.
AQ-4: Implement exhaust aftertreatment, such as scrubbers for SO_2 and selective catalytic reduction for NO_X, on a vessel-specific basis, if feasible.	Using exhaust aftertreatment, such as scrubbers for SO_2 and selective catalytic reduction for NO_X, for example, would reduce SO_2 and NO_X emissions, respectively.
AQ-5: Use diesel particulate filters and diesel oxidation catalysts to retrofit older (USEPA Tiers 1–3) diesel engines, if feasible.	Using diesel particulate filters and diesel oxidation catalysts to retrofit older (USEPA Tiers 1–3) diesel engines would reduce diesel particulate matter emissions and associated health risks.
AQ-6: Require their contractors to use ports equipped with shore power and zero-emissions material-handling equipment and construction firms that offer	Using ports equipped with shore power and zero-emissions material-handling equipment, in addition to alternative-fueled or zero-emissions equipment and

Recommended Practice	Potential Benefit
alternative-fueled or zero-emissions equipment and vehicles, if feasible.	vehicles, would reduce criteria air pollutant and GHG emissions during construction.
AQ-7: Require their contractors to use a combination of combustion and post-combustion controls to meet or exceed applicable marine engine standards.	Using a combination of combustion and post-combustion controls to meet or exceed applicable marine engine standards would reduce criteria air pollutant and GHG emissions during construction, operations, and decommissioning.
AQ-8: Perform and present a technical feasibility analysis for air quality RPs 1 through 5 (AQ-1 – AQ-5), ensuring a comprehensive review of each measure's effectiveness, and readiness for implementation. The technical feasibility analysis should be submitted as part of a brief memo following finalization of the Facility Design Report and Fabrication and Installation Report, totaling no more than 10 pages.	Performance of technical feasibility analysis would ensure a comprehensive review of each measure's effectiveness and readiness for implementation, which potentially could lead to more reduction of criteria air pollutant and GHG emissions than would otherwise occur.
MUL-12: Incorporate ecological design elements where practicable. For example, nature inclusive design products are an alternative to conventional concrete that could result in reduced GHG emissions.	Using ecological design elements, such as alternatives to conventional concrete, could reduce criteria air pollutant and GHG emissions during construction.

3.4 Physical Resources

3.4.2 Water Quality

This section discusses potential impacts on water quality from the Proposed Action, alternatives, and ongoing and planned activities in the water quality geographic analysis area. The water quality geographic analysis area, as shown on Figure 3.4.2-1, includes a 10-mile (16.1-kilometer) radius around the NY Bight lease areas along with inshore waterways around representative ports that may be used for the NY Bight projects. The offshore geographic analysis area accounts for some transport of water masses due to ocean currents. The inshore geographic analysis area was chosen to capture the extent of the natural network of waterbodies that could be affected by port utilization for construction and operation activities of the NY Bight projects.

The water quality impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs. Project- and site-specific analysis of water quality impacts, including the analysis of offshore and onshore cable and landfall installation, would be required in the COP NEPA document.

3.4.2.1 Description of the Affected Environment and Future Baseline Conditions

Waters in the geographic analysis area include both offshore waters and inshore waterways. The offshore waters include the Atlantic Ocean within the NY Bight lease areas that include vessel routes to/from representative port facilities. Inshore waterways include those of the Delaware Bay, Delaware River, Raritan Bay, Sandy Hook Bay, Newark Bay, East River, Passaic River, Hackensack River, Hudson River, and New York Bay to potential transmission POIs. As the exact locations and activities for each project are not known at this programmatic stage, the project-specific NEPA analysis will include inshore areas for each NY Bight lease area if conditions or activities are different than the analyses of representative areas and projects included in this PEIS.

Table 3.4.2-1 identifies key parameters that characterize water quality, with several of these parameters being accepted proxies for ecosystem health (e.g., dissolved oxygen, nutrient levels). Temperature and salinity delineate fresh from marine surface waters. States assess a variety of other water quality parameters (bacteria, metals, total suspended solids, etc.) as part of their requirements to evaluate and list state waters as impaired under CWA Section 303(d). If a water body is classified as non-attaining per the 303(d) requirements, a designated beneficial use (e.g., recreation, fish consumption) is considered impaired by an exceedance of one or more water quality parameters.

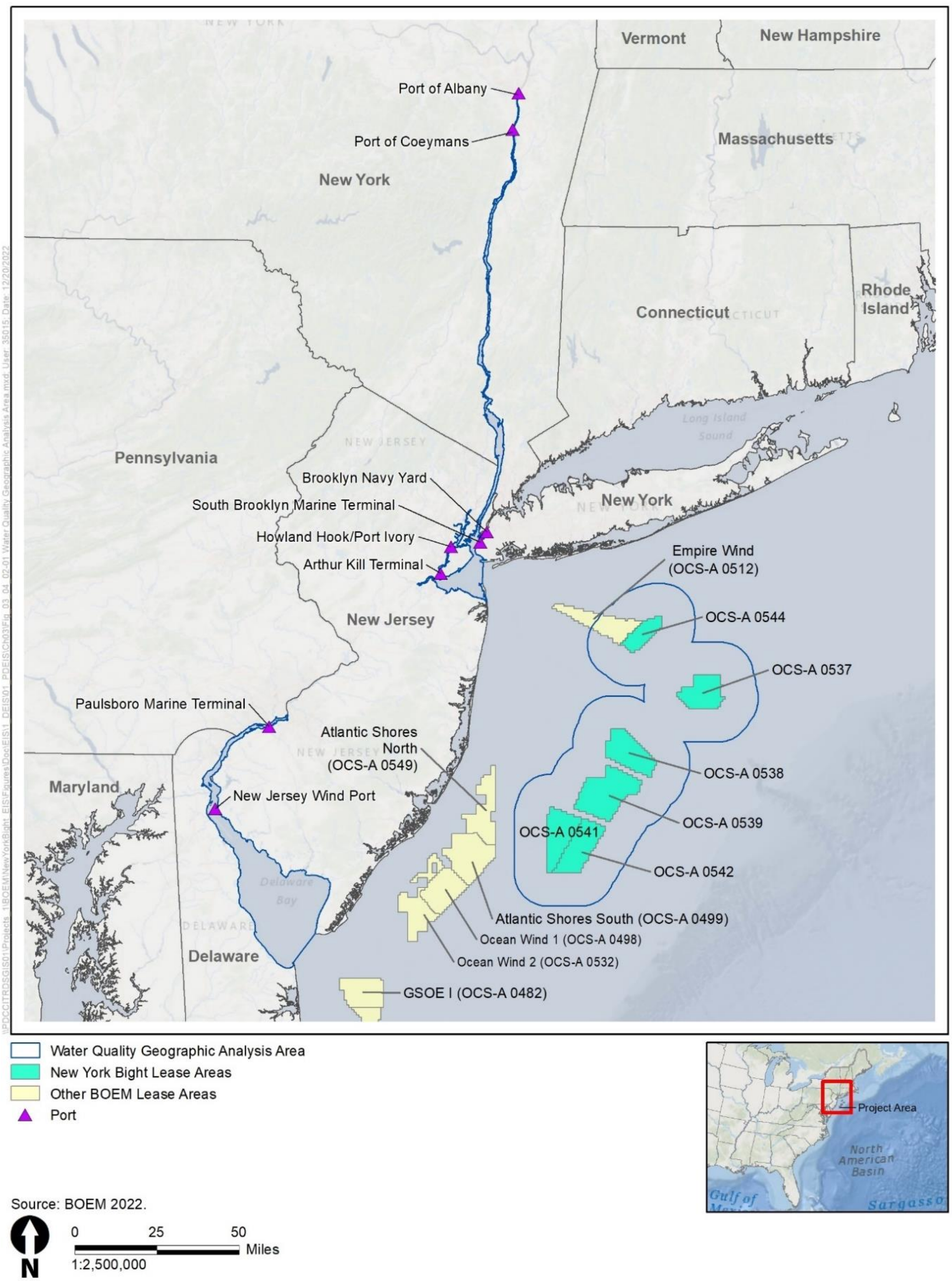


Figure 3.4.2-1. Water quality geographic analysis area

Table 3.4.2-1. Key water quality parameters with characterizing descriptions

Parameter	Characterizing Description
Temperature	Water temperature heavily affects species distribution in the ocean with large-scale changes that may impact seasonal phytoplankton blooms.
Salinity	Salinity, or salt concentration, also affects species distribution. Seasonal variation is smaller than year-to-year variation and less predictable than temperature changes (Wallace et al. 2018).
Dissolved oxygen	Dissolved oxygen concentrations should be above 5 mg/L to maintain a stable environment; lower levels may affect sensitive organisms (USEPA 2000).
Chlorophyll *a*	Chlorophyll *a* is an indicator of primary productivity. The USEPA considers estuarine and marine levels of chlorophyll <5 µg/L to be good, 5 to 20 µg/L to be fair, and >20 µg/L to be poor (USEPA 2021a).
Turbidity	Turbidity is a measure of water clarity. High turbidity reduces light penetration, reduces ecological productivity, and provides attachment places for other pollutants (USGS 2018). Marine waters generally have less turbidity than estuaries.
Nutrients	Phytoplankton are the foundation of the marine food web, and their associated growth rates depend on nutrient (e.g., nitrogen, phosphorus, and carbon, plus calcium and silicon are various micronutrients) availability in the water. Excess nutrients (i.e., from natural or human-derived sources) can cause problematic algal blooms that significantly lower dissolved oxygen concentrations in ambient waters.

mg/L = milligrams per liter; µg/L = microgram per liter.

The offshore U.S. waters of the Atlantic Ocean, including potential offshore export cable corridors and lease areas, have little variation in salinity and temperature though a vertical variation (i.e., stratification) occurs on a seasonal basis (conductivity-temperature-depth data from the World Ocean Database 2021). Stratification typically is strongest in the summer when surface waters are warmer and somewhat less saline than bottom waters; well-mixed and more uniform vertical salinity and temperature profiles are evident in the fall. In late spring and early summer, a strong thermocline develops at an approximately 20-meter depth across the entire shelf of the Mid-Atlantic Bight, isolating a continuous mid-shelf cold pool of water that extends from Nantucket to Cape Hatteras (Miles et al. 2021). The Mid-Atlantic Bight Cold Pool holds nutrients over the shelf during the spring and summer, which in turn promotes phytoplankton productivity and affects fish distributions and behavior (Lentz 2017; Miles et al. 2021; Nye et al. 2009).

The Mid-Atlantic Bight Cold Pool is highly dynamic over its annual lifespan and among years (Chen and Curchitser 2020), experiencing significant changes in stratification, with peak stratification occurring in summer and with weaker stratification occurring during its formation and breakdown in spring and fall (Miles et al 2021). Additionally, the isolated volume of cold bottom water shifts location, predominately moving southwestward along the shelf as it slowly warms through the season (Miles et al. 2021).

As of 2022, the offshore U.S. waters of the Atlantic Ocean are considered attainable (i.e., meeting water quality standards/goals) per the 303(d) requirements. With increasing distance from shore, oceanic circulation patterns play an increasingly larger role in dispersing and diluting anthropogenic contaminants and determining water quality. Waters are assessed as impaired when an applicable water quality standard is not being attained. The top causes of pollution associated with impairment in assessed bays and estuaries are mercury, most common in fish tissue; polychlorinated biphenyls (PCBs), persisting in sediments and fish tissue; and pathogens, which indicate possible fecal contamination (USEPA 2017). PCBs in sediments, among other legacy chemicals (i.e., mercury, dichlorodiphenyltrichloroethane, and dioxin), potentially exceed water quality standards and can be resuspended in the water column during major storm events or from activities such as dredging.

Waterbodies within the state of New York include 1,530 square miles (3,963 square kilometers) of estuaries. As of 2016, the most recent reporting year for 303(d), 29 percent of the impaired coastal waters for fishing in New York state was impaired because of bacteria and other microbes (USEPA 2022). Waterbodies within the state of New Jersey include 1,098 square miles (2,844 square kilometers) of estuarine/ocean waters. The top reasons for impairment of coastal waters in New Jersey are low oxygen (48 percent) for aquatic life and PCBs (39 percent) in fish tissue affecting fish consumption (USEPA 2022). Waterbodies within the state of Delaware include 902 square miles (2,336 square kilometers) of estuarine waters with 100 percent of coastal waters impaired for fish consumption due to PCBs and 33 percent impaired for fish, aquatic life, and wildlife due to low oxygen; however, Delaware is seeing reductions in nutrients and toxins through the implementation of the Watershed Approach to Toxics Assessment and Restoration Program (USEPA 2022).

Table 3.4.2-2 lists the 303(d) non-attainable waterbodies per state authority for the waterbodies (oceans, estuaries, bays, rivers, and lakes) within the geographic analysis area. The estuaries and rivers (inshore waterways) are impaired for fish consumption due to various pollutants such as mercury, PCBs and other toxins, dioxin, and chlordane in fish tissues and for shellfish restrictions due to fecal coliform.

The USEPA monitors water quality trends over time through a national coastal condition assessment. This assessment establishes a water quality index to describe the water quality of various coastal areas by assigning three condition levels (good, fair, and poor) for several water quality parameters. Table 3.4.2-3 lists the USEPA Region 2 (including New Jersey and New York) and 3 (Mid-Atlantic, including Delaware) condition levels per parameter for 2005, 2010, and 2015 (USEPA 2021b). Regions 2 and 3 include the offshore waters and inshore waterways in the geographic analysis area. Since 2005, the percentage of "good" ratings has increased for most of the parameters analyzed (i.e., water clarity ratings within the good category have increased from 72.5 percent in 2005 to 93.3 percent in 2015 for Region 2 and from 4.17 percent in 2005 to 52.5 percent in 2015 for Region 3). Exceptions to this trend are evident for dissolved phosphorus for both regions and chlorophyll *a* for Region 2. Dissolved phosphorus in Region 2 increased, resulting in a greater number of "fair" ratings from 2005 to 2015 as well as fewer "good" ratings from 2010 to 2015. For Region 3, dissolved phosphorus increased, resulting in fewer "good" ratings from 2005 to 2015. In Region 2, chlorophyll *a* decreased, resulting in a greater number of "good" ratings from 2005 to 2010; however, it increased from 2010 to 2015, resulting in fewer "good" ratings. Overall, based on the USEPA's National Coastal Condition Assessment (USEPA 2021b), water quality is in good condition for both regions.

Table 3.4.2-2. 303(d) non-attainable waterbodies per State authority found in the geographic analysis area

Waterbody	Last Year Reported	CWA 303(d) Classification	Non-attainable Use	Impairment
Under Delaware Authority				
Delaware River	2022	Impaired	1) Fish Consumption (Zones 5 and 5c) 2) Fish, Aquatic Life, and Wildlife (Zone 5c)	1) Dieldrin; dioxin; furan compounds; PCBs 2) Dissolved oxygen
Delaware Bay	2022	Impaired	1) Fish Consumption	1) Mercury; PCBs
Under New Jersey Authority				
Delaware River	2020	Impaired	1) Fish Consumption	1) Chlordane, DDT, dieldrin; mercury and PCBs in fish tissue
Delaware Bay	2020	Impaired	1) Aquatic Life 2) Fish Consumption 3) Shellfish Harvesting	1) Turbidity 2) Chlordane, DDT, dieldrin, and mercury; PCBs in fish tissue 3) Fecal coliform
Coastal Atlantic Water (Herring Island to Barnegat Inlet)	2020	Impaired	1) Aquatic Life	1) Dissolved oxygen
Upper New York Bay/ Kill Van Kull	2020	Impaired	1) Aquatic Life 2) Fish Consumption	1) Index of biological integrity[1] 2) Benzo[a]pyrene (PAHs), heptachlor epoxide, and PCBs; chlordane, dieldrin, dioxin, and hexachlorobenzene in fish tissue
Kill Van Kull West	2020	Impaired	1) Aquatic Life 2) Fish Consumption	1) Index of biological integrity 2) Benzo[a]pyrene (PAHs) and heptachlor epoxide; chlordane, dieldrin, dioxin, hexachlorobenzene, and PCBs in fish tissue
East River-Hudson River	2020	Impaired	1) Aquatic Life 2) Fish Consumption	1) Index of biological integrity; total phosphorous 2) Benzo[a]pyrene (PAHs) and heptachlor epoxide; chlordane, DDT, dieldrin, dioxin, hexachlorobenzene, and mercury and PCBs in fish tissue
Hackensack River	2020	Impaired	1) Aquatic Life 2) Fish Consumption	1) Dissolved oxygen; index of biological integrity; nickel 2) Benzo[a]pyrene (PAHs), heptachlor epoxide, and nickel; chlordane, DDT, dieldrin, dioxin, mercury, and PCBs in fish tissue

Waterbody	Last Year Reported	CWA 303(d) Classification	Non-attainable Use	Impairment
Under New York Authority				
Upper New York Bay	2018	Impaired	1) Fish consumption	1) Copper, dioxin, PCBs
Lower East River	2018	Impaired	1) Secondary contact recreation	1) Dissolved oxygen, floating debris, PCBs, trash
Hudson River	2018	Impaired	1) Fish and shellfish consumption	1) PCBs
Long Island Sound	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Manhasset Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Hempstead Harbor	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Oyster Bay Harbor	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Dosoris Pond	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Mill Neck Creek	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Cold Spring Harbor	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
South Oyster Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
East Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Middle Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Garret Lead/East Channel	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Reynolds Channel, East	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Freeport Cr/East Meadow Br, Lower	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Hempstead Bay, Broad Channel	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Hewlett Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Brosewere Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
East Rockaway Inlet	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Woodmere Channel	2018	Impaired	1) Shellfish consumption	1) Fecal coliform
Bannister Creak/Bay	2018	Impaired	1) Shellfish consumption	1) Fecal coliform

Source: USEPA 2022, NYSDEC 2020.
[1] An environmental scoring tool that transforms raw biological data collected from a water body into a simple numerical score of overall ecological condition.
CWA = Clean Water Act; DDT = dichlorodiphenyltrichloroethane; PAHs = polycyclic aromatic hydrocarbons; PCBs = polychlorinated biphenyls.

Table 3.4.2-3. Water quality conditions in estuarine coastal areas for the USEPA Regions 2 and 3 to stations based on data collected in 2005, 2010, and 2015

Parameter	2005	2010	2015
Region 2, including New Jersey, New York			
Dissolved oxygen	Fair (17.2%), good (59.6%)	Fair (22.1%), good (71.8%)	Fair (27%), good (73%)
Chlorophyll *a*	Fair (25.2%), good (36.7%)	Fair (28.9%), good (61%)	Fair (35.1%), good (52%)
Water clarity	Fair (1.2%), good (72.5%)	Fair (5.3%), good (86.2%)	Fair (5.1%), good (93.3%)
Dissolved nitrogen	Fair (9.8%), good (54.9%)	Fair (19.8%), good (74.2%)	Fair (11.9%), good (82.7%)
Dissolved phosphorous	Fair (34.2%), good (19.2%)	Fair (70.7%), good (1.3%)	Fair (79.1%), good (5.6%)
Region 3, including Delaware			
Dissolved oxygen	Fair (20%), good (62%)	Fair (10.7%), good (62.5%)	Fair (14.3%), good (65.4%)
Chlorophyll *a*	Fair (56%), good (7.3%)	Fair (88%), good (5.6%)	Fair (71.2%), good (9.4%)
Water clarity	Fair (31.3%), good (41.7%)	Fair (28.7), good (49.1%)	Fair (18.3%), good (52.5%)
Dissolved nitrogen	Fair (14.8%), good (76.2%)	Fair (11.3%), good (83.4%)	Fair (7.4%), good (89.1%)
Dissolved phosphorous	Fair (23.6%), good (64.8%)	Fair (29.4%), good (60.4%)	Fair (37.6%), good (52.5%)

Source: USEPA 2021b, the *U.S. EPA National Coastal Condition Assessment*.

The NY Bight is a storm-dominated shelf, with the general southwestward drift of water modulated by more intense storm-induced flows (Vincent et al. 1981). The northeast area of the geographic analysis area (Figure 3.4.2-1) is characterized by moderate ocean currents, with very few observations of speeds greater than 1.3 miles per hour (0.6 meter per second) (UKHO 2009). The net direction of currents south of Long Island Sound, New York is southwest along-coast (Levin et al. 2018; Lentz 2008; UKHO 2009). In the Southern New England and Mid-Atlantic Bight subregions (Clark and Brown 1977), the direction of currents on the shelf is offshore and south (Townsend et al. 2004). Across the shelf in deeper waters, the current flows in the opposite direction of the shelf current (Stevenson et al. 2004). Although ocean currents are largely stable, local-scale (i.e., meters to a few kilometers) variability in currents is observed, in part due to wind and tides and their combined effects.

Groundwater reservoirs underlie areas where onshore project activities could occur. Some of these reservoirs provide water supplies to communities, including USEPA-designated sole source aquifers, which are aquifers that supply at least 50-percent of the drinking water for an area with no other sources available if the aquifer is contaminated. Sole-source aquifers that overlap areas where onshore project activities may occur include the New Jersey Coastal Plains aquifer system, Kings/Queens Counties (Brooklyn-Queens) aquifer system, and the Nassau/Suffolk Counties Long Island aquifer system.

A series of representative ports have been identified for analysis within the PEIS. These ports include the Brooklyn Navy Yard, South Brooklyn Marine Terminal, Howland Hook/Port Ivory, Arthur Kill Terminal, Paulsboro Marine Terminal, New Jersey Wind Port, Port of Albany, and Port of Coeymans.

Ongoing activities that define current conditions and trends within the geographic analysis area that contribute to impacts on water quality resources are diverse and numerous: weather/natural events; global climate change; terrestrial runoff and point source discharges; atmospheric deposition related to urbanization; forestry practices; municipal waste discharges; agriculture; marine vessel traffic related discharges, including the potential for accidental releases and marine debris; wastewater; marine minerals use and ocean-dredged material disposal regulated by the U.S. Army Corps of Engineers (USACE); bridge and coastal road construction; fisheries use, management, and monitoring surveys; recreation and tourism; port expansions; undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); tidal energy projects; and military operations.

As one of the key drivers behind water quality change over time, climate change (including warming sea temperatures, rising sea levels, ocean acidification, etc.) can affect water quality, causing changes and variability within the ecosystem. Northeast regional ocean temperatures have warmed faster than the global ocean over the last two decades according to the National Oceanic and Atmospheric Administration (NOAA 2021). Additionally, there is some evidence indicating that the Mid-Atlantic Bight Cold Pool is both warming and shrinking due to the effects of climate change, which will likely affect species distributions and total ecosystem productivity in the Mid-Atlantic Bight (Friedland et al. 2022).

3.4.2.2 Impact Level Definitions for Water Quality

Definitions of potential impact levels are provided in Table 3.4.2-4. Beneficial impacts on water quality are described using the definitions described in Section 3.3.2 (see Table 3.3-1).

Table 3.4.2-4. Adverse impact level definitions for water quality

Impact Level	Definition
Negligible	There would be no measurable impacts, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Changes would be measurable but would not result in degradation of water quality in exceedance of water quality standards.
Moderate	Changes would be measurable and would result in localized, short-term degradation of water quality in exceedance of water quality standards.
Major	Changes would be measurable and would result in extensive, long-term degradation of water quality in exceedance of water quality standards.

Accidental releases, anchoring, cable emplacement and maintenance, discharges/intakes, land disturbance, port utilization, and presence of structures are contributing IPFs to impacts on water quality. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.4.2-5.

Table 3.4.2-5. Issues and indicators to assess impacts on water quality

Issue	Impact Indicator
Runoff, sedimentation, sediment movement, suspension or resuspension, changes to stratification or mixing patterns, or release of contaminants.	Changes to turbidity, nutrients, dissolved oxygen, temperature, salinity, or chlorophyll *a*. Introduction of new contaminants/oil or changes to sediments, or changes in flows.
Disturbance or seepage to groundwater resources.	Changes to turbidity, nutrients, dissolved oxygen, temperature, salinity, or chlorophyll *a*. Introduction of new contaminants/oil or changes to sediments, or changes in flows.

3.4.2.3 Impacts of Alternative A – No Action – Water Quality

When analyzing the impacts of the No Action Alternative on water quality, BOEM considered the impacts of ongoing activities, including non-offshore-wind and offshore wind activities on the baseline conditions for water quality. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with the other planned non-offshore and offshore wind activities, which are described in Appendix D*, Planned Activities Scenario*.

3.4.2.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, water quality is likely to continue to follow current regional trends and respond to current environmental and societal activities. Ongoing activities within the geographic analysis area that contribute to impacts on water quality generally relate to or include stormwater runoff, ground disturbance (e.g., construction) and erosion, point and non-point source discharges, and atmospheric deposition (see Appendix D, Table D1-23). Empire Wind (OCS-0512) is the only ongoing offshore wind project in the offshore geographic analysis area. Impacts from ongoing construction of the Empire Wind project are described as part of the cumulative impacts of the No Action Alternative in Section 3.4.2.3.2. The accumulation of pollutants in surface waters from stormwater runoff and leaching into groundwater can result in exceedances of water quality standards that can affect the uses of the water (e.g., drinking water, aquatic life, recreation). While water quality impacts may be temporary and localized (e.g., construction), and state and federal statutes, regulations and permitting requirements (e.g., Clean Water Act Section 402) avoid or minimize these impacts, issues with water quality can still persist, resulting in minor impacts.

Additionally, global climate change is an ongoing and developing phenomenon, in the absence of offshore wind development, that causes ocean acidification, warming sea temperatures, rising sea levels, and changes in ocean circulation patterns that can affect water quality.

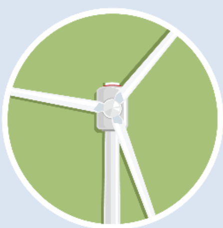
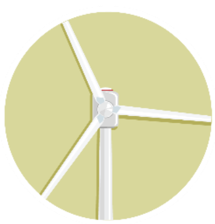
3.4.2.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects).

Other planned non-offshore-wind activities that affect water quality include onshore development activities (including urbanization, forestry practices, municipal waste discharges, and agriculture), marine transportation-related discharges, dredging and port improvement projects, commercial fishing, military use, and new submarine cables, transmission systems (e.g., PBI), and pipelines (see Appendix D, Section D.2 for a description of planned activities). Water quality impacts from these activities, especially from dredging and harbor, port, and terminal operations, are expected to be localized and temporary to permanent, depending on the nature of the activities and associated IPFs. Similar to ongoing activities, the discharge of contaminated runoff into surface waters and groundwater can result in exceedances of water quality standards that can affect water uses (e.g., drinking water, aquatic life, recreation). State and federal water quality protection requirements and permitting would result in avoiding and minimizing these impacts.

Ongoing and planned offshore wind activities within the geographic analysis area that contribute to impacts on water quality are listed in Table 3.4.2-6. Empire Wind (OCS-A 0512) is the only ongoing offshore wind project in the offshore geographic analysis area (Table 3.4.2-6). The inshore waterways leading to ports that may be used by the NY Bight projects may also be used by other planned offshore wind projects along the U.S. Atlantic coast. If construction of offshore export cables for the NY Bight projects overlap with other offshore wind projects, impacts from these other projects are expected to be similar to those described in the following IPFs.

Table 3.4.2-6. Ongoing and planned offshore wind in the geographic analysis area for water quality

Ongoing/Planned	Projects by Region
Ongoing – 2 projects[1] 	**NY/NJ** • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 0 projects[2] 	**NY/NJ** • None within the geographic analysis area

NJ = New Jersey; NY = New York.
[1] Refer to footnote 10 in PEIS Chapter 1 for additional information on the status of Empire Wind 1 and 2.
[2] Status as of September 20, 2024.

Accidental releases: Planned non-offshore-wind and offshore wind activities could expose offshore and inshore waterways to contaminants (such as fuel; sewage; solid waste; or chemicals, solvents, oils, or grease from equipment) in the event of a spill or release during routine vessel use, collisions and allisions, or equipment failure including WTGs or OSSs. As described in Section 2.3, *Non-Routine Activities and Events*, accidental releases of chemicals, gases, or man-made debris may occur as a result of a structural failure and could result in impacts on water quality. All planned non-offshore-wind and offshore wind activities would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and BSEE. OSRPs or Construction Spill Prevention Control and Countermeasures (SPCCs) are required for every project and would provide for rapid spill response, clean up, and other measures that would help to minimize potential impacts on affected resources from spills. BOEM assumes all projects and activities would comply with laws and regulations to minimize releases.

Vessel activity would increase during offshore wind construction and installation stages and would therefore increase the potential for vessel allisions/collisions and fuel spills. The probability of a fuel spill would be minimized by preventative measures (i.e., onboard containment measures and OSRPs/SPCCs) during routine vessel operations (i.e., fuel transfer). The extent and persistence of water quality impacts from a fuel spill would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures.

Using the assumptions in Appendix D, Table D2-3, approximately 128,184 gallons (485,229 liters) of coolants and 1,053,770 gallons (3,988,953 liters) of fuels, oils, and lubricants would be involved during construction of the WTGs and OSSs for the Empire Wind 1 and 2 (OCS-A 0512) projects (the only ongoing offshore wind projects within the water quality geographic analysis area). Other chemicals, including grease, paints, and sulfur hexafluoride, would also be used at the offshore wind projects, and black and grey water may be stored in vessels and at onshore facilities. BOEM's study "Environmental Risks, Fate and Effects of Chemicals Associated with Wind Turbines on the Atlantic Outer Continental Shelf" presented extensive analysis and modeling to determine the probability and potential environmental consequences of a chemical spill at offshore wind facilities (Bejarano et al. 2013). The modeling effort revealed the most likely type of spill is a non-routine event and could occur from the WTGs at a volume of 90 to 440 gallons (341 to 1,666 liters), at a rate of one time in 1 to 5 years, or a diesel fuel spill of up to 2,000 gallons (7,571 liters) at a rate of one time in 91 years. The likelihood of a spill occurring from multiple WTGs and OSSs at the same time is very low and, therefore, the potential impacts from a spill larger than 2,000 gallons (7,571 liters) are largely discountable. BOEM anticipates that the likelihood of a non-routine catastrophic, or maximum-case scenario, release of all oils and chemicals to be very low (Bejarano et al. 2013). Small-volume spills could occur during OSS transformer maintenance or transfer of fluids (oils and chemicals), while low-probability small- or large-volume spills could occur due to vessel collisions, allisions such as a vessel striking against a WTGs/OSS, or incidents such as toppling during a storm or earthquake.

The use of heavy equipment onshore could result in potential spills during use or refueling activities. Onshore construction and installation activities and associated equipment would involve fuel and lubricating and hydraulic oils.

Trash and debris accidentally released into the marine environment can harm marine animals through entanglement and ingestion. All vessel operators are required to adhere to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Annex V requirements, USEPA and USCG regulations, and BSEE regulations. Therefore, it would be infrequent and negligible.

An accidental release would generally be localized and likely result in no degradation to water quality in exceedance of water quality standards. In the unlikely event a large spill occurred, impacts on water quality would be short- to long-term and negligible to moderate, depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the spill location, as well as the effectiveness of spill response measures. Due to the low likelihood of an accidental spill occurring and the expected size of the most likely spill, the overall impact of accidental releases is anticipated to be localized, resulting in no to little degradation to water quality in exceedance of water quality standards. As such, accidental releases from planned non-offshore and offshore wind development would not be expected to contribute appreciably to the cumulative impacts on water quality.

Anchoring: Anchoring associated with planned non-offshore and offshore wind activities could contribute to changes in water quality through resuspension of sediments during construction and installation, O&M, and conceptual decommissioning stages. Additional anchoring associated with military use and survey, commercial, and recreational activities could also contribute to changes in water quality. Disturbances to the seabed during anchoring would temporarily increase suspended sediment and turbidity levels in and immediately adjacent to the anchorage area. The intensity and extent of the additional sediment suspension effects would be less than that of cable emplacement (see *Cable emplacement and maintenance* IPF) and would therefore be unlikely to have an impact beyond the immediate vicinity.

BOEM estimates that approximately 18 acres (7.3 hectares) of seabed could be affected by anchoring for the Empire Wind (OCS-A 0512) projects within the NY Bight water quality geographic analysis area (Appendix D, Table D2-2). Due to the current ambient conditions and the localized area of disturbances around each of the individual anchors, the overall impact of increased sediment and turbidity from vessel anchoring is anticipated to be minor and localized, and it would not result in degradation of ambient water quality. Therefore, anchoring would not be expected to appreciably contribute to the cumulative impacts on water quality.

Cable emplacement and maintenance: The installation of array cables and offshore export cables would include site preparation activities (e.g., boulder removal), cable installation via jetting (primary method), plowing, trenching, and dredging, which can cause temporary increases in turbidity and sediment resuspension. A sediment transport analysis model was conducted for the only ongoing offshore wind projects within the geographic analysis area, the Empire Wind 1 and 2 projects (OCS-A 0512) (Tetra Tech 2022). The model showed the displacement of sediments would be low, and that sediments would remain suspended for a short period of time (4 hours) and typically dissipate to background levels very close to the trench.

The model simulated jet plowing, the primary installation method to be used for the Empire Wind projects (OCS-A 0512). The sediment transport model predicted that the sediment plume would typically travel between 328 feet (100 meters) and 1,640 feet (500 meters) during flood and ebb conditions but could travel more than 3,280 feet (1,000 meters) in some areas with stronger currents. Maximum plume concentrations at 3,280 feet (1,000 meters) would be below 30 milligrams per liter at all stations, with the exception of the two stations with strong currents. Project-specific NEPA analysis will provide greater details for the specific New York Bight lease areas.

Coarse particles (medium sand and larger) would not be suspended in the water column from jet plow activities. Fine sand would settle to the bed in less than 1 minute and within 3 feet (1 meter) to 16 feet (5 meters) of the trench centerline, depending on current velocities. Silts and clays would remain suspended for approximately 4 hours and would be transported farther from the trench. The maximum deposition thickness would be at the trench centerline, with an average deposition thickness of 9.52 inches (24 centimeters). Deposition thickness would decrease rapidly with distance from the jet plow; at a distance of 82 feet (25 meters), the average deposit thickness would be less than 0.37 inch (0.95 centimeter) for flood tides, and less than 0.08 inch (0.20 centimeter) for ebb tides. Within 492 feet (150 meters) of the trench, deposition thicknesses would be negligible, at less than 0.04 inch (0.1 centimeter), along most of the proposed submarine export cable routes. The mass flow excavation installation method was also modeled because there are some known locations for Empire Wind where jet plowing would not be feasible. The plume distance and distance at which sediment would settle from the trench would be similar to or less than under jet plowing.

Due to the prevailing ambient water quality conditions, localized areas of disturbances, and range of variability within the water column, the overall impacts of increased sediments and turbidity from cable emplacement and maintenance are anticipated to be minor, localized, and short-term, resulting in no degradation to ambient water quality. New cable emplacement and maintenance activities would not be expected to appreciably contribute to cumulative impacts on water quality.

Port utilization: Planned non-offshore and offshore wind activities could increase port utilization, possibly including port expansion/modification. Port expansion could include dredging, deepening, and construction of new berths, resulting in increased potential for increased turbidity, sedimentation, and accidental releases (fuel spills, trash/debris, etc.). However, any port expansions/modifications would comply with all applicable permit requirements. Vessels would adhere to all USCG and MARPOL 73/78 Annex V requirements and, as applicable, the NPDES vessel general permit. Due to construction timeframes and decreased operational traffic, the overall impact of accidental spills and sedimentation during port utilization is anticipated to be minor, localized, and short-term, resulting in little to no degradation to water quality. Port utilization is not expected to contribute to cumulative impacts on water quality.

Presence of structures: Empire Wind 1 and 2 (OCS- A 0512) (the only ongoing wind projects in the NY Bight water quality geographic analysis area) would result in 140 structures in the water, 135 acres (55 hectares) of impact from installation of foundations and scour protection, and 123 acres (49.8 hectares) of impact from hard protection (e.g., armoring) for the offshore export cables and interarray cables. These structures would result in some alteration of local water currents leading to increased movement, suspension, and deposition of sediments, but significant scour is not expected in deep water locations, where most of the structures would be located. Scouring that leads to impacts on water quality through the formation of sediment plumes generally occurs in shallow areas with tidally dominated currents (Harris et al. 2011). Structures may reduce wind-forced mixing of surface waters, whereas water flowing around the foundations may increase vertical mixing.

Offshore wind facilities could have impacts on atmospheric and oceanographic processes (including the Mid-Atlantic Bight Cold Pool) through the presence of structures and the extraction of energy from the wind. There has been extensive research into characterizing and modeling atmospheric wakes created by wind turbines to design the layout of wind facilities and hydrodynamic wake/turbulence related to predicting seabed scour. However, relatively few studies have analyzed the hydrodynamic wakes coupled with the interaction of atmospheric wakes with the sea surface. Further, even fewer studies have analyzed wakes and their impact on regional scale oceanographic processes (i.e., Mid-Atlantic Bight Cold Pool) and potential secondary changes to primary production and ecosystems. Studies on this topic have focused on ocean modeling rather than field measurement campaigns.

The general understanding of offshore wind–related impacts on hydrodynamics is derived primarily from European-based studies. A synthesis of European studies by Van Berkel et al. (2020) summarized the potential effects of wind turbines on hydrodynamics, the wind field, and fisheries. Local to a wind facility, the range of potential impacts include increased turbulence downstream, remobilization of sediments, reduced flow inside wind farms, downstream changes in stratification, redistribution of water temperature, and changes in nutrient upwelling and primary productivity. Human-made structures, especially tall vertical structures such as foundations, alter local water flow at a fine scale by potentially reducing wind-driven mixing of surface waters or increasing vertical mixing as water flows around the structure (Carpenter et al. 2016; Cazenave et al. 2016; Segtnan and Christakos 2015). When water flows around the structure, turbulence is introduced that influences local current speed and direction. Turbulent wakes have been observed and modeled at the kilometer scale (Cazenave et al. 2016; Vanhellemont and Ruddick 2014). While impacts on current speed and direction decrease rapidly around monopiles, there is a potential for hydrodynamic effects out to a kilometer from a monopile (Li et al. 2014). Direct observations of the influence of a monopile extended to at least 984 feet (300 meters); however, changes were indistinguishable from natural variability in a subsequent year (Schultze et al. 2020). The range of observed changes in current speed and direction 984 to 3,281 feet (300 to 1,000 meters) from a monopile is likely related to local conditions, wind farm scale, and sensitivity of the analysis. In strongly stratified locations such as the NY Bight, the mixing seen at monopiles is often masked by processes forcing toward stratification (Schultze et al. 2020), but the introduction of nutrients from depth into the surface mixed layer can lead to a local increase in primary production (Floeter et al. 2017; refer to Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, Section 3.5.6, *Marine Mammals*, Section 3.5.7, *Sea Turtles*, and Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, regarding hydrodynamic and atmospheric wake effects on primary production). The same factors that form and maintain the Mid-Atlantic Bight Cold Pool are likely to limit the extent of measurable hydrodynamic effects. Localized mixing will still occur, bringing nutrients to the surface.

A hydrodynamic model was run for four different WTG build-out scenarios of the offshore Rhode Island and Massachusetts lease areas that found offshore wind projects have the potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification), via their influence on currents from WTG foundations and by extracting energy from the wind (Johnson et al. 2021). The model demonstrated that introduction of the WTGs modifies the oceanic responses of current magnitude (flow speed), wave heights, and temperature in the following three ways:

- WTGs exert a drag force on flowing water, resulting in a reduction in current magnitude.

- Current magnitude and wave height are reduced as the WTGs extract energy from the wind, reducing the wind field surrounding the WTGs and therefore reducing the energy transfer from the wind to the sea.
- The presence of the WTGs initiates a downstream wake, where eddies and turbulence influence the temperature stratification through vertical mixing.

The changes in currents and mixing would fluctuate seasonally and regionally and affect water quality parameters (e.g., temperature, dissolved oxygen, salinity). Each of the three ways in which WTGs modify ocean conditions could influence ocean mixing and, in turn, stratification that is a key characteristic of the Mid-Atlantic Bight Cold Pool. However, the net impact of offshore wind farms on ocean stratification is dependent on the relative contribution of these three processes and potentially other currently unknown processes in a particular wind farm facility (Miles et al. 2021). WTGs and the OSSs would be placed in water depths ranging from 100 to 200 feet (31 to 61 meters) where current speeds are relatively low, and offshore cables would be buried where possible. Cable armoring would be used where burial is not possible, such as in hard-bottomed areas. BOEM anticipates that developers would implement BMPs to minimize seabed disturbance from foundations, scour protection, and cable installation. As a result, impacts on offshore water quality would likely be minor and localized and would not degrade water quality in exceedance of water quality standards.

The exposure of offshore wind structures, which are mainly made of steel, to the marine environment can result in corrosion without protective measures. Corrosion is a general problem for offshore infrastructures, and corrosion protection systems are necessary to maintain their structural integrity. Protective measures for corrosion (e.g., coatings, cathodic protection systems) are often in direct contact with seawater and have different potentials for emissions of metals or organic compounds into the marine environment, e.g., galvanic anodes emitting metals, such as aluminum, zinc, and indium, and organic coatings releasing organic compounds due to weathering or leaching.

Research conducted in the North Sea found that galvanic anodes result in the continuous emission of inorganic matter into the local marine environment for the life of the project. Reese et al. (2020) stated that more than 80 kilograms of aluminum-anode material per monopile foundation per year are emitted into the marine environment. Kirchgeorg et al. (2018) found that the use of aluminum anodes would reduce the total annual emissions by a factor of approximately 2.5 (5,511 pounds [118, 000 kilograms]) due to the higher current capacity than zinc anodes for an offshore wind farm with 80 WTG monopile foundations. Depending on the pH of the ambient water, Reese et al. (2020) found that, along with the main elements that compose a galvanic anode, toxicologically relevant elements such as zinc, cadmium, and lead will be emitted during the anode's lifetime. In-situ measurements of the leached elements are confounded by background levels of these elements in both sediment and seawater within the wind farms (Reese et al. 2020).

The current understanding of chemical emissions for offshore wind structures is that emissions appear to be low, suggesting a low environmental impact, especially compared to other offshore activities; however, these emissions may become more relevant for the marine environment with increased numbers of offshore wind projects and a better understanding of the potential long-term effects of corrosion protection systems (Kirchgeorg et al. 2018). Based on the current understanding of offshore wind structure corrosion effects on water quality, BOEM anticipates the potential impact to be minor. The presence of structures would not be expected to appreciably contribute to the cumulative impacts on water quality.

Discharges/intakes: While WTGs and OSSs are typically self-contained and do not generate discharges under normal operating conditions, some offshore wind projects may use HVDC converter stations that would convert AC to DC before transmission to onshore project components. The most effective way to cool these HVDC systems is by pumping in seawater through a heat exchanger to cool the deionized water within the system (Middleton and Barnhart 2022) and then discharge warmer water back into the ocean. The seawater is filtered through 500 microns to remove sand and other small particles. While the discharge is warmer than the surrounding ocean water, it is normally considered to have a minimal effect because thermal discharge will be quickly absorbed by the surrounding water mass and returned to ambient temperatures within a minimal distance from the discharge pipe. The discharge pipes are typically positioned about 30 feet (9.1 meters) above the seafloor. Chemicals such as bleach (sodium hypochlorite) in a concentration of roughly 10 to 200 parts per million would be used to prevent the growth of biofilms and encrusting organisms in the system. As a result, due to potential impacts on water quality to surrounding sea water, a USEPA NPDES permit would be required (Middleton and Barnhart 2022). Empire Wind 1 and 2 (OCS-A 0512) are the only ongoing offshore wind projects in the geographic analysis area and have not proposed the use of HVDC substations.

Planned offshore wind activities would result in a small increase in overall vessel traffic, with a short-term peak during construction. Vessel activity associated with planned offshore wind construction activities within the geographic analysis area for water quality, excluding the NY Bight lease areas, is expected to occur regularly beginning in 2023 and continuing through 2030 and then lessen to near existing condition levels during operations. Increased vessel traffic would be localized near affected ports and offshore construction areas. Planned offshore wind activities would result in an increase in regulated discharges from vessels, particularly during construction and conceptual decommissioning, but the events would be staggered over time and localized. Offshore permitted discharges would include uncontaminated bilge water and treated liquid wastes. BOEM assumes that all vessels/facilities operating in the same area will comply with federal and state regulations on effluent discharge, including the requirement for a USEPA NPDES permit and interim requirements of the Vessel Incidental Discharge Act (85 *Federal Register* 67818). All planned offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of discharges and the prevention and control of nonindigenous species. All vessels would need to comply with USCG ballast water management requirements outlined in 33 CFR part 151 and 46 CFR part 162. Furthermore, all vessels would need to meet USCG bilge water regulations outlined in 33 CFR part 151, and allowable vessel discharges, such as bilge and ballast water, would be restricted to uncontaminated or properly treated liquids. Therefore, due to the minimal amounts of allowable discharges from vessels associated with planned non-offshore and offshore wind activities, BOEM expects impacts on water quality resulting from vessel discharges are likely to be minimal and not result in degradation of water quality in exceedance of water quality standards.

The overall impacts of discharges from vessels are anticipated to be negligible due to the staggered increase in vessels from various projects; the current regulatory requirements administered by the USEPA, USACE, USCG, and BSEE; and the restricted allowable discharges. Based on the above, the level of impact in the water quality geographic analysis area from planned non-offshore and offshore wind activities would be similar to existing conditions and would not be expected to appreciably contribute to the cumulative impacts on water quality.

Land disturbance: Planned non-offshore and offshore wind activities could include onshore components that could contribute to water quality impacts through sedimentation and accidental spills of fuels and lubricants. BOEM assumes that each project would avoid and minimize water quality impacts through BMPs, OSRPs/SPCCs, stormwater pollution prevention plans (SWPPPs), and compliance with applicable permit requirements. Overall, the impacts from onshore activities that occur near waterbodies could result in temporary introduction of sediments or pollutants into inshore waterways in small amounts where erosion and sediment controls fail. Land disturbance for planned offshore wind activities that are at a distance from waterbodies and that implement erosion and sediment control measures would be less likely to affect water quality. Impacts on water quality would be minor and localized with no degradation in water quality in exceedance of water quality standards and would be limited to periods of onshore construction and periodic maintenance over the life of each project. Land disturbance from planned non-offshore and offshore wind activities is not expected to appreciably contribute to the cumulative impacts on water quality.

3.4.2.3.3 Conclusions

Impacts of the No Action Alternative. Water quality would continue to follow current regional trends and respond to current environmental and societal activities, including climate change. BOEM expects ongoing non-offshore-wind activities would likely have temporary and **negligible** to **minor** impacts on water quality primarily through accidental releases and sediment suspension related to vessel traffic, port utilization, presence of structures, discharges/intakes, and land disturbance.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, existing environmental trends and ongoing activities, including climate change, would continue to affect water quality in the geographic analysis area. Planned non-offshore-wind activities—including installation of new submarine cables and pipelines, onshore development, marine surveys, and port improvements—would contribute to cumulative impacts on water quality and would likely be undetectable. Similarly, planned offshore wind projects would also contribute to water quality impacts from sediment resuspension during construction and conceptual decommissioning, specifically from cable laying (including seabed preparations and pre-installation grapple runs), vessel discharges, sediment contamination, discharges from the WTGs and OSSs during operation, sediment plumes due to scour, and erosion and sedimentation from onshore construction. Construction and conceptual decommissioning activities associated with planned offshore wind activities would lead to increases in sediment suspension and turbidity. However, sediment suspension and turbidity increases would be temporary and localized, and BOEM anticipates the impacts to be minor. BOEM has considered the possibility of impacts resulting from accidental releases. A moderate impact could occur if there was a large-volume, catastrophic release; however, the probability of catastrophic release occurring is very low and the expected size of the most likely spill would be very small and of low frequency. Therefore, the cumulative impacts of the No Action Alternative on water quality from ongoing and planned activities would likely be **negligible** to **minor** because any potential detectable impacts are not anticipated to exceed water quality standards.

3.4.2.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Water Quality

3.4.2.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Accidental releases: Accidental releases during construction and installation, O&M, and conceptual decommissioning could involve fuel, oil, and lubricants. As discussed in Section 3.4.2.3, *Impacts of Alternative A – No Action – Water Quality*, the risk of a spill from an offshore structure would be low, and any effects would likely be localized. Increased vessel activity during construction, installation, and conceptual decommissioning would increase the potential for vessel allisions/collisions and fuel spills. However, collisions and allisions are anticipated to be unlikely based on the following factors that would be considered for a single NY Bight project and applied at the project-specific NEPA stage: USCG requirement for lighting on vessels, NOAA vessel speed restrictions, the lighting and marking plan that would be implemented, and the inclusion of a single NY Bight project's components on navigation charts. The single NY Bight project's SPCC and OSRP would be implemented and adhered to, which would provide for rapid spill response, cleanup, and other measures to minimize any potential impact on affected resources from spills and accidental releases, including spills resulting from catastrophic events.

In the unlikely event an allision or collision involving vessels or components associated with one single NY Bight project resulted in a large spill, impacts from a single NY Bight project alone on water quality would be short- to long-term depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill. Overall, the probability of an oil or chemical spill occurring that is large enough to affect water quality is extremely low, and the degree of impact on water quality would depend on the spill volume. This risk and impact would be minor and localized with no degradation in water quality in exceedance of water quality standards, with the unlikely event of a large accidental release potentially causing a moderate and short-term impact.

Increased accidental releases of trash and debris may occur from vessels primarily during construction but also during operations and conceptual decommissioning of planned offshore wind facilities. BOEM assumes all vessels would comply with laws and regulations to properly dispose of marine debris and to minimize releases. In the event of a release, it would likely be an accidental, localized event in the vicinity of projects; therefore, project-related marine debris would only have a short-term effect on water quality.

The onshore construction site size and overall weather conditions can affect the total volume of stormwater discharge. Through the SWPPP and applicable NPDES permits for a NY Bight project, proper spill containment gear and absorption materials would be required to be maintained for immediate use in the event of any inadvertent spills or leaks. BOEM anticipates that the impacts from accidental releases on water quality would result in negligible and temporary impacts on surface and groundwater quality including sole source aquifers as a result of releases from heavy equipment during construction or conceptual decommissioning and other cable installation activities.

Anchoring: During construction, installation, and conceptual decommissioning activities, there is a potential for increased vessel anchoring. Anchoring can cause resuspension and deposition of sediments in the immediate area of disturbance. The anticipated acreage of impact from anchoring is not known for one NY Bight project; however, assuming anchoring impacts are similar to Empire Wind (OCS-A 0512), which has proposed 18 acres (7.3 hectares) of potential anchor disturbance, the impacts on water quality from a single NY Bight project due to anchoring would be localized, temporary, and minor during construction and conceptual decommissioning. Anchoring during operation would decrease due to fewer vessels required during operation, resulting in reduced impacts.

Cable emplacement and maintenance: The installation of array cables and offshore export cables would be conducted via jet plow, mechanical plow, or mechanical trenching, which can cause temporary increases in turbidity and sediment resuspension. Other projects using similar installation methods observed minor impacts on water quality due to the localized nature of the disturbance (Latham et al. 2017). Impacts from suspended contaminated sediments if present would result in detectable, localized, short-term degradation of water quality in exceedance of water quality standards along the offshore export cable corridor. A sediment transport model for Empire Wind (OCS-A 0512) (Tetra Tech 2022), which may be representative of the NY Bight lease areas, indicated that displacement of sediments would be low, would remain suspended for a short period of time (4 hours), and typically dissipate to background levels (Section 3.4.2.3.2 contains additional details on the sediment transport modeling). Based on the RPDE (Chapter 2, Section 2.1.2, *Alternative B – No Identification of AMMM Measures at Programmatic Stage*), a single NY Bight project offshore export cable emplacement would disturb an estimated maximum width of 131 feet (40 meters) of seabed, with up to 929 miles (1,495 kilometers) of export cable. Impacts on water quality from construction and conceptual decommissioning due to new cable emplacement and maintenance would be short-term and minor.

Port utilization: The Brooklyn Navy Yard, South Brooklyn Marine Terminal, Howland Hook Port Ivory, Arthur Kill Terminal, Paulsboro Marine Terminal, New Jersey Wind Port, Port of Albany, and Port of Coeymans have been identified for analysis within the PEIS, although not all ports would be used at the same time. Each port facility under consideration already has sufficient existing infrastructure or has an area where other entities intend to develop infrastructure with the capacity to support offshore wind activity, including one NY Bight project. Activities associated with the development of a single NY Bight project would add to existing baseline impacts on water quality due to routine port operations. If port expansions or modifications are necessary for a single NY Bight project, they would be completed in accordance with state and federal regulations and permits and would be completed in collaboration with multiple entities (e.g., port owners, local governmental agencies, states, other offshore wind developers). Port expansion could include dredging, deepening, and construction of new berths, resulting in impacts on water quality through accidental spills, leaks, or discharges or sedimentation during port use. Specific ports and expansions will be further discussed in project-specific COPs and COP-level NEPA analyses. Additionally, impacts on water quality would result from vessel traffic. The increase in vessel activity during the construction and installation stage of a single NY Bight project would be small. Multiple authorities regulate water quality impacts from port activities, and vessel activity would decrease during operations and conceptual decommissioning stages. Therefore, impacts of construction, operation, and conceptual decommissioning on water quality from port utilization would be negligible.

Presence of structures: A single NY Bight project would add up to 280 WTGs and would include a disturbance width of up to 131 feet (40 meters) per export cable. As described under the No Action Alternative, results from a hydrodynamic modeling study found that offshore wind projects have the potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification) via their influence on currents from WTG foundations and by extracting energy from the wind (Johnson et al. 2021). These disturbances would be localized but, depending on the hydrologic conditions, have the potential to impact water quality through altering mixing patterns and the formation of sediment plumes.

BOEM expects an analysis for potential for scouring and mobility of the seabed using information collected during the marine site investigations during COP development to identify areas within the NY Bight lease areas where significant scour could occur around foundations and other hard structures (dependent on water currents, wave action, and water depths). Low current speeds and minimal seabed mobility are good indicators that potential significant scour would not occur. The addition of scour protection would minimize the potential for scour at the base of foundations. Also, limited scour is anticipated around the cables due to the cable burial depths (3 to 9.8 feet [0.9 to 3 meters] for interarray cables and 3 to 19.6 feet (0.9 to 6 meters) for export cables).

In addition, as described under the No Action Alternative, the exposure of offshore wind structures to the marine environment can result in emissions of metals and organic compounds from corrosion protection systems. However, the current understanding of chemical emissions for offshore wind structures is that emissions appear to be low, suggesting a low environmental impact (Kirchgeorg et al. 2018).

Impacts on water quality from the presence of structures during construction and installation, O&M, and conceptual decommissioning would be reoccurring and continual but range from negligible to minor.

Discharges/intakes: Construction of a single NY Bight project would generate up to 51 vessels operating in a lease area or over the offshore export cable route at any given time (Section 3.6.6, *Navigation and Vessel Traffic*). Various vessel types (e.g., installation, cable-laying, support, transport/feeder, and crew vessels) would be deployed throughout the NY Bight project area during the construction and installation phase. Impacts from discharges from vessel traffic from one NY Bight project would be similar as described under the No Action Alternative as all vessels would need to comply with USCG ballast water discharge and other regulatory requirements, which would minimize impacts. Based on the BMPs and compliance with applicable vessel requirements, BOEM anticipates that the impacts on water quality from discharges would be minor during construction and, to a lesser degree, during O&M and conceptual decommissioning activities due to the decrease in the number of vessels needed for these activities.

Sediment resuspension during potential dredging for one NY Bight project could result in release of sediment contaminants into the water column. The dredged material would be transported for disposal at a licensed facility in accordance with applicable regulations and permit requirements. The total suspended sediments and associated contaminant concentrations generated by the in-water activities would be temporary and would result in minor short-term impacts on water quality.

One NY Bight project may use a HVDC converter OSS that would convert AC to DC before transmission to onshore project components. These HVDC systems are typically cooled by an open loop system that intakes cool sea water and discharges warmer water back into the ocean (Middleton and Barnhart 2022). Chemicals such as bleach (sodium hypochlorite) would be used to prevent growth in the system and keep pipes clean. The warm water discharged is generally considered to have a minimal effect as it will be mixed by the surrounding water and returned to ambient temperatures over time. Even though localized effects on water quality from the discharge of warmer water could take place in the area immediately surrounding the outlet pipe, the overall impacts are expected to be minimal with no degradation of water quality. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts.

Land disturbance: Onshore components of one NY Bight project are anticipated to include a specific transmission POI in New York or New Jersey and an interconnection point to a regional offshore grid substation. Proper erosion and sedimentation controls would be maintained to avoid and minimize unstable soils that could potentially be moved by wind and runoff into surface waters or groundwater resources and increase turbidity per permitting requirements or the applicable rules/regulations. This would continue protecting groundwater as drinking water resources, including sole source aquifers. BOEM assumes a SWPPP would be developed and implemented and the appropriate NPDES permit obtained to avoid and minimize water quality impacts during construction. HDD is expected to be used at landfall sites to minimize land disturbance near the shoreline. It is possible that potential, limited sediment releases could occur during the HDD, but impacts would be localized and not long lasting. As such, impacts on water quality from land disturbance is anticipated to be temporary, lasting only the duration of construction, and would be negligible.

3.4.2.4.2 Impacts of Six Projects

The same IPFs (accidental releases, anchoring, cable emplacement and maintenance, presence of structures, discharges/intakes, and land disturbance) described for a single NY Bight project apply to six NY Bight projects with more of a potential for impacts due to the greater amount of offshore and onshore development under six NY Bight projects. This includes an increase in the number of vessels for potential accidental releases and discharges/intakes that could affect water quality as well as additional anchoring and cable emplacement and maintenance causing increased sediment resuspension and deposition. Under six NY Bight projects, up to 1,125 foundation locations for WTGs and OSSs could be installed, which would increase the potential for scour and mobility of the seabed and include hydrodynamic impacts from the WTGs. However, due to the anticipated low currents and the use of scour protection, potential sediment transport would be minimized. Therefore, the impacts from presence of structures would increase for six NY Bight projects due to the increased number of WTGs and the associated hydrodynamic changes; however, impacts on water quality would be minimized due to the use of scour protection. If multiple projects are being constructed within the same timeframe, the impacts on water quality would be greater than those identified for one NY Bight project but not enough to change the overall impact ratings that range from negligible to minor, depending on the IPF, since the projects would likely not overlap each other geographically and the most impacts would be localized and short-term. As stated for one NY Bight project, multiple authorities regulate the impacts on water quality through permits and regulations that would still apply to six NY Bight projects.

Port utilization is still anticipated to be negligible (see Section 3.4.2.4.1, *Impacts on One Project*). The increase in vessel activity would be small with multiple authorities regulating water quality impacts. If any port expansions are required to accommodate six NY Bight projects, the impact on water quality is anticipated to be minor due to the port improvements complying with all applicable permit requirements to minimize, reduce, or avoid impacts.

3.4.2.4.3 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of Alternative B would contribute to the primary IPFs of accidental releases, anchoring, cable emplacement and maintenance, port utilization, presence of structures, discharges/intakes, and land disturbance and result in sediment resuspension and deposition, an increased potential for accidental releases, and changes to water mixing patterns that could affect water quality. However, impacts on water quality would range from negligible to minor, depending on the IPF, given the short-term temporary impacts of suspended sediment including contaminant resuspension, and the regulatory and permitting requirements to avoid and minimize impacts on water quality. In the unlikely event of an accidental release, the impacts would remain moderate.

In context of reasonably foreseeable environmental trends and planned actions, if multiple projects are constructed within the same timeframe, impacts of Alternative B would range from undetectable to noticeable. If construction timeframes of the six NY Bight projects were staggered, this could further minimize the potential for overlapping impacts. BOEM anticipates that the cumulative impacts associated with Alternative B when combined with past, present, and future activities would be minor and would not alter the overall character of water quality in the geographic analysis area for all IPFs except for a large accidental release, which would remain moderate.

The measurable impacts anticipated would be small, and water quality would recover completely without remedial or mitigating action. Six NY Bight projects would contribute to—but would not have an appreciable change to—the overall impact rating within the geographic area.

3.4.2.4.4 Conclusions

Impacts of Alternative B. Construction and installation, O&M, and conceptual decommissioning of Alternative B for either one NY Bight project or six NY Bight projects would likely have **negligible** to **minor** impacts on water quality, depending on the IPF, with the unlikely event of a large accidental release potentially causing a **moderate** impact.

Cumulative Impacts of Alternative B. Alternative B would contribute to the cumulative impact rating primarily through the increased turbidity, potential contaminant resuspension, and sedimentation due to anchoring and cable emplacement during construction, and alteration of water currents and increased sedimentation during O&M due to the presence of structures. Considering all the IPFs together, BOEM anticipates that the impacts of six NY Bight projects in the geographic analysis area combined with ongoing activities, planned offshore wind activities, and reasonably foreseeable environmental trends would likely result in **negligible** to **minor** cumulative impacts on water quality. BOEM has considered the possibility of impacts resulting from accidental releases. A **moderate** cumulative impact could occur if there was a large-volume, catastrophic release; however, the probability of this occurring is very low. In context of reasonably foreseeable environmental trends, the impacts contributed by Alternative B to the cumulative impacts on water quality would be undetectable.

3.4.2.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Water Quality

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight Area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alterative B, and the analysis for Sub-alternative C2 is presented as the change from Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.4.2.5.1 Sub-Alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations (Table 3.4.2-7).

Table 3.4.2-7. Summary of previously applied avoidance, minimization, mitigation, and monitoring measures for water quality

Measure ID	Measure Summary
WQ-1	This measure would require lessees avoid using zinc sacrificial anodes on external components of WTG and OSS foundations to reduce the release of metal contaminants in the water column.
WQ-2	This measure proposes lessees submit an Oil Spill Response Plan (33 U.S.C. 1321) subject to BSEE review and approval that would contain information regarding facility location, oil type, notification procedures, clean-up equipment, sensitive resources at risk, and other information.
MUL-1	This measure proposes training, recovery, prevention, and reporting to reduce and eliminate trash and debris in order to reduce impacts from entanglement, ingestion, smothering of benthic species, and pollutants in the water column.
MUL-2	This measure proposes submittal and implementation of an anchoring plan to reduce impacts from turbidity and avoid anchor placement in sensitive habitats, including hardbottom and structurally complex habitats, as well as any known or potential cultural resources.

Impacts of One Project

AMMM measures are intended to minimize marine debris emanating from project vessels and shoreline activities, turbidity resulting from anchoring, and sediment disturbance. Identification of AMMM measures under Sub-alternative C1 could minimize some impacts on accidental releases and anchoring. Impacts for other IPFs would remain the same as described under Alternative B.

Accidental releases: MUL-1 would potentially reduce water quality impacts because there would theoretically be a reduced amount of trash and debris entering the water, and therefore fewer pollutants that could have negative impacts on water quality. WQ-1 would reduce the potential for water quality impacts from the release of metal contaminants into the water column by avoiding the use of zinc sacrificial anodes on WTG and OSS foundations. WQ-2 would require lessees prepare an Oil Spill Response Plan subject to BSEE review, which would minimize the potential effects from accidental oil spills by ensuring spills are cleaned up effectively and in a timely manner.

Anchoring: MUL-2 would require an Anchoring Plan, which could minimize sediment disturbance and the related turbidity through the use of anchor chain midline buoys to prevent cable sweep as well as not side-casting materials during cable emplacement, thereby reducing turbidity impacts on water quality.

Impacts of Six Projects

Identification of the AMMM measures for six NY Bight projects would have greater benefits to the overall water quality from NY Bight project activities than measures for one NY Bight project by minimizing local water quality impacts from turbidity, debris, and discharges due to the potential larger geographic area where impacts on water quality would be reduced. The potential impacts on water quality for six NY Bight projects under Sub-alternative C1 compared to six NY Bight projects under Alternative B are not anticipated to be substantially different.

Cumulative Impacts of Sub-Alternative C1 (Preferred Alternative)

Under Sub-alternative C1, the same ongoing and planned non-offshore-wind and offshore wind activities that would occur with Alternative B would continue to contribute to the primary IPFs of accidental releases, anchoring, cable emplacement and maintenance, port utilization, presence of structures, discharges/intakes, and land disturbance. Impacts on water quality are anticipated to be the same as described under Alternative B for six NY Bight projects with reduction through AMMM measures by minimizing local water quality impacts from turbidity, debris, and discharges. In context of reasonably foreseeable environmental trends, the impacts contributed by Sub-alternative C1 to the cumulative impacts on water quality would be undetectable. Impacts would remain minor for all IPFs, except for a large accidental release, which would remain moderate.

3.4.2.5.2 Sub-Alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified AMMM measures that have not been previously applied for water quality, and therefore, the impacts on water quality under Sub-alternative C2 are the same as Sub-alternative C1.

3.4.2.5.3 Conclusions

Impacts of Alternative C. AMMM measures would reduce impacts from trash and debris, anchoring, and sediment disturbance under Sub-alternative C1. However, these reductions likely would not alter the impact rating from Alternative B for either one NY Bight project or six NY Bight projects (**negligible** to **minor**; **moderate** for a large spill). Because no not previously applied AMMM measures were identified under Sub-alternative C2 impacts would remain the same as Sub-alternative C1 for both one and six NY Bight projects.

Cumulative Impacts of Alternative C. BOEM anticipates that the cumulative impacts for six NY Bight projects on water quality in the geographic analysis area would likely be **negligible** to **minor**, depending on the IPF, with the unlikely event of a large accidental release potentially causing a **moderate** impact. In context of reasonably foreseeable environmental trends, the impacts contributed by Sub-alternative C1 to the cumulative impacts on water quality would be undetectable. The identification of AMMM measures that would have otherwise not been implemented under Alternative B would not alter the impact rating. Because no not previously applied AMMM measures were identified under Sub-alternative C2, impacts would remain the same as Sub-alternative C1.

3.4.2.6 Recommended Practices for Consideration at the Project-Specific Stage

In addition to the AMMM measures identified under Sub-alternatives C1 and C2, BOEM is recommending lessees consider analyzing the RPs in Table 3.4.2-8 to further reduce potential water quality impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.4.2-8. Recommended Practices for water quality impacts and related benefits

Recommended Practice	Potential Benefit
MUL-21: Use or upgrade/retrofit to the best available technology, including new and emerging technology, when possible, which may include using closed-loop cooling systems.	A closed-loop subsea cooler system is an emerging technology, that, if applied, would not involve the intake or discharge of seawater, potentially reducing the potential effects from this IPF.
MUL-27: Employ methods to minimize sediment disturbance.	The impacts from turbidity through the use of anchor chain midline buoys to prevent cable sweep, as well as not side-casting materials during cable emplacement, could reduce turbidity impacts on water quality.
MUL-28: Develop an *Inadvertent Returns Plan*, and details preferred drilling solutions and methods.	This RP would potentially reduce pollutant impacts on water quality, as an *Inadvertent Returns Plan* would address prevention, control, and cleanup of potential inadvertent return and would avoid discharging drilling fluids onto the seabed.

3.5 Biological Resources

3.5.1 Bats

This section discusses potential impacts on bat resources from the Proposed Action, alternatives, and ongoing and planned activities in the geographic analysis area. The bat geographic analysis area, as shown on Figure 3.5.1-1, includes the United States coastline from Maine to Florida and extends 100 miles (161 kilometers) offshore and 5 miles (8 kilometers) inland to capture the movement range for species in this group. The offshore limit was established to capture the migratory movement of most species in this group, while the onshore limits cover onshore habitats used by species that may be affected by onshore and offshore components of the NY Bight projects.

The bat impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Because the locations of onshore components for the NY Bight projects are not known at this time, the analysis of onshore bat impacts is dependent on a hypothetical project analysis, and impact conclusions consider a maximum-case scenario for onshore development. Additional detailed site-specific analysis will be required for individual COPs. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

3.5.1.1 Description of the Affected Environment and Future Baseline Conditions

The number of bat species in the geographic analysis area varies by state, ranging from 8 species (Rhode Island, New Hampshire, and Maine) to 17 (Virginia and North Carolina) (Rhode Island Department of Environmental Management n.d.; Maine Department of Inland Fisheries and Wildlife 2021; New Hampshire Fish and Game n.d.; Virginia Department of Wildlife Resources 2021; North Carolina Wildlife Resources Commission 2017). There are 9 bat species present in New Jersey and New York, 8 of which may be present in coastal New Jersey and New York, and 6 that are year-round residents (Table 3.5.1-1) (NYSDEC n.d.; Maslo, B., Leu, K., 2013).

Bats are terrestrial species that spend almost their entire lives on or over land. Bat species can be broken down into cave-hibernating bats and migratory tree bats based on their wintering strategy. Both groups are nocturnal insectivores that use a variety of forested and open habitats for foraging during the summer. Migratory tree bats fly to southern parts of the United States in the winter. On occasion, migratory tree bats may potentially occur offshore during spring and fall migration and under very specific conditions like low wind and high temperatures. Recent studies, combined with historical anecdotal accounts, indicate that migratory tree bats periodically travel offshore during spring and fall migration, with 80 percent of acoustic detections occurring in August and September (Dowling et al. 2017; Hatch et al. 2013; Pelletier et al. 2013; Stantec 2016). However, unlike migratory tree bats, the likelihood of detecting a *Myotis* species or other cave bat is substantially less in offshore areas, including at distances of lease areas on the OCS (Pelletier et al. 2013).

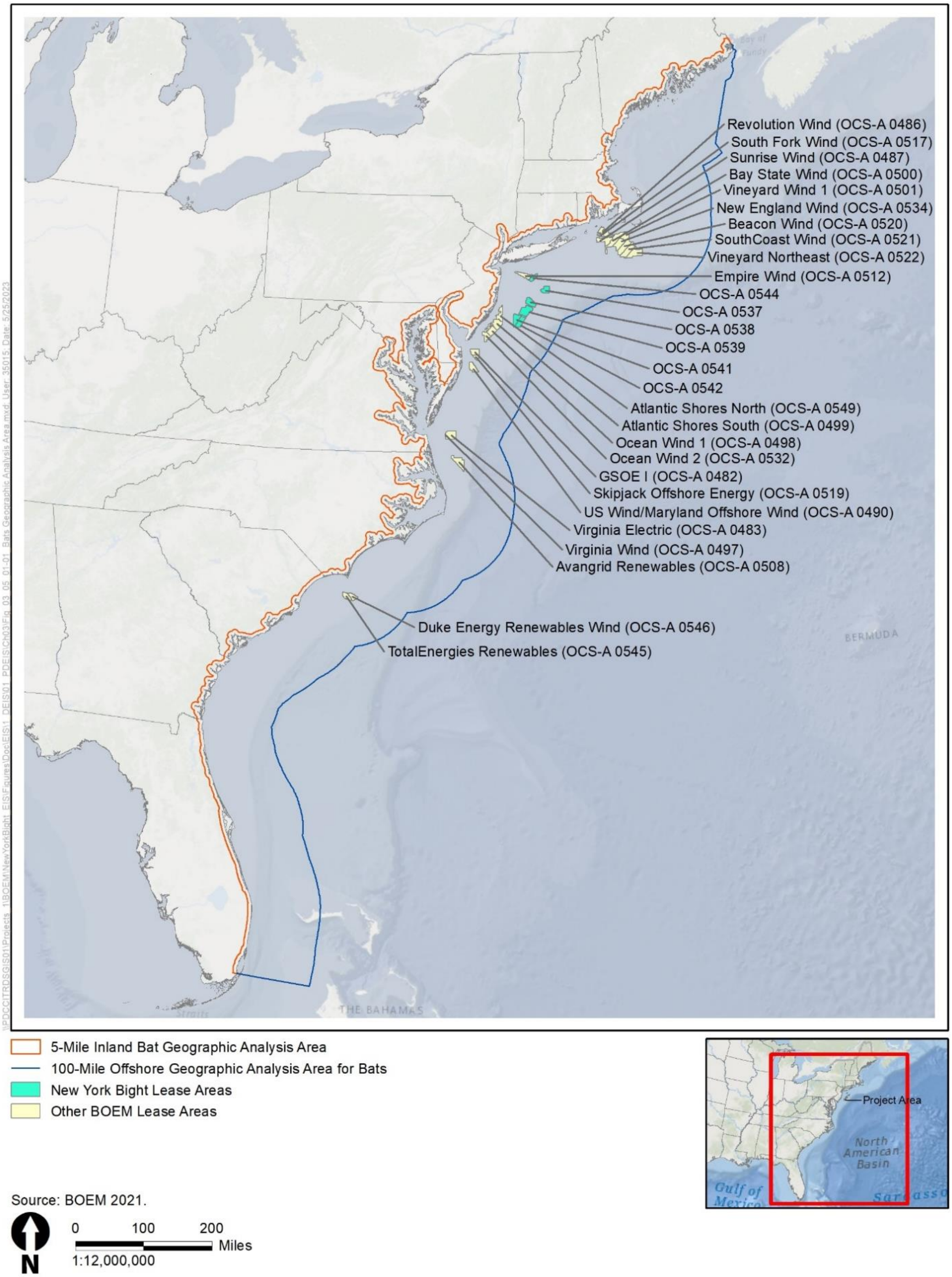


Figure 3.5.1-1. Bats geographic analysis area

Table 3.5.1-1. Bats present in New Jersey and New York and their conservation status

Common Name	Scientific Name	NY Status	NJ Status	Federal Status
Cave-Hibernating Bats				
Eastern small-footed bat[1]	*Myotis leibii*	Species of Concern	--	--
Little brown bat[1]	*Myotis lucifugus*	Species of Greatest Conservation Need	--	Under Review[3]
Northern long-eared bat[1, 2]	*Myotis septentrionalis*	Endangered	Endangered	Endangered
Indiana bat[4]	*Myotis sodalis*	Endangered	Endangered	Endangered
Tri-colored bat[1]	*Perimyotis subflavus*	Proposed Endangered	Proposed Endangered	Proposed Endangered
Big brown bat[5]	*Eptesicus fuscus*	--	--	--
Migratory Tree Bats				
Eastern red bat[5]	*Lasiurus borealis*	--	--	--
Hoary bat[5]	*Lasiurus cinereus*	--	--	--
Silver-haired bat[5]	*Lasionycteris noctivagans*	--	--	--

Source: USFWS 2021

[1] Currently a candidate for state listing as endangered pending rule promulgation (NJDEP 2013).

[2] On November 29, 2022, USFWS announced its intention to reclassify the northern long-eared bat as endangered. The new rule pertaining to the further conservation of the species took effect on March 31, 2023.

[3] Currently under a USFWS discretionary status review. Results of the review may be to propose listing, make a species a candidate for listing, provide notice of a not warranted candidate assessment, or other action as appropriate.

[4] Range does not indicate species presence in coastal New Jersey and New York.

[5] Currently a candidate for New Jersey state listing as special concern pending rule promulgation (NJDEP 2013).

The presence of bats has been documented in the offshore marine environment in the United States (Cryan and Brown 2007; Dowling et al. 2017; Hatch et al. 2013; Pelletier et al. 2013). Bats have been documented temporarily roosting on structures (i.e., lighthouses) on nearshore islands and there is evidence of eastern red bats migrating offshore in the Atlantic. In a Mid-Atlantic bat acoustic study conducted for a total of 86 nights during the spring and fall of 2009 and 2010, the maximum distance that bats were detected from shore was 13.6 miles (21.9 kilometers) and the mean distance was 5.2 miles (8.4 kilometers) (Sjollema et al. 2014). In Maine, bats were detected on islands up to 25.8 miles (41.6 kilometers) from the mainland (Peterson et al. 2014). In the Mid-Atlantic acoustic study, eastern red bats represented 78 percent of all bat detections offshore and bat activity decreased as wind increased (Sjollema et al. 2014). In addition, eastern red bats were detected in the Mid-Atlantic up to 27.3 miles (44 kilometers) offshore by high-definition video aerial surveys (Hatch et al. 2013).

The available data indicates that bat activity levels are generally lower offshore compared to onshore (Hein et al. 2021). A bat migration study in the North Sea off Belgium found that the number of bat detections was up to 24 times lower at offshore locations compared to the onshore locations (Brabant et al. 2021). During shipboard acoustic surveys conducted by Stantec in 2017 at the operational Block Island Wind Farm in Rhode Island, 911 bat passes were detected offshore. Bats were detected during 41 of 125 (33 percent) survey nights (Stantec 2018). The overall bat detection rate (passes/detector night) was 7.3, with up to 190 passes recorded during a single night. In addition, USDOE funded an acoustic survey of bat activity offshore and at coastal sites (onshore mainland locations on and near the shoreline) in the New England Gulf of Maine, mid-Atlantic coast, and Great Lakes regions from 2012–2014 (Stantec 2016). This was a very large survey effort across a wide area that detected a total of

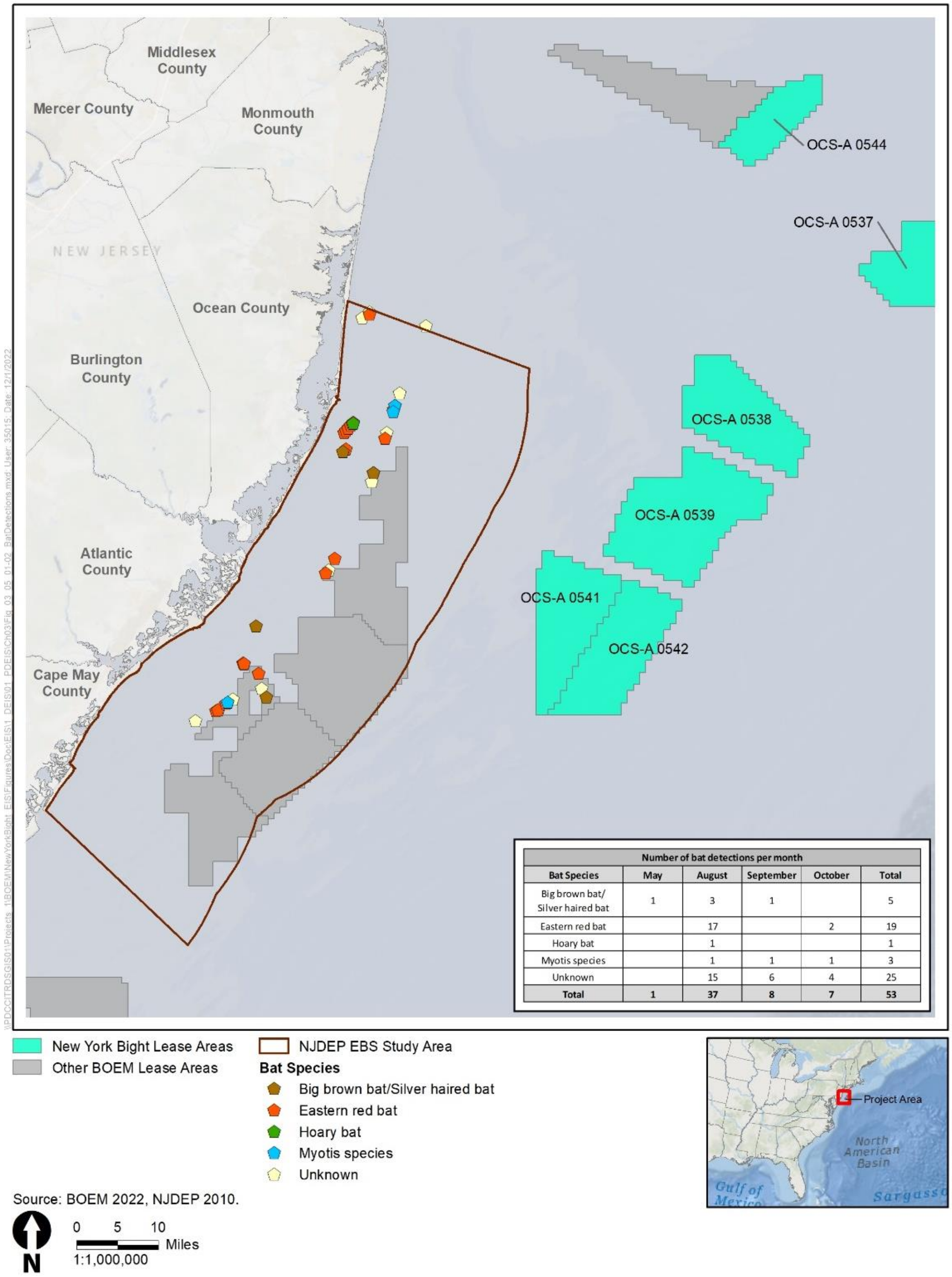
565,158 bat passes during a total of 17,730 detector nights. The mean number of bat passes per night in offshore open water was 4.96, while the number of bat passes per night for coastal onshore was significantly higher at 112.6. Surveys also found that 90 percent of bat passes occurred at times when wind speeds were below 5.0 m/s and temperatures were at or above 15.0 degrees Celsius (Stantec 2018).

Cave-hibernating bats hibernate regionally in caves, mines, and other structures and feed primarily on insects in terrestrial and freshwater habitats. These species generally exhibit lower activity in the offshore environment than the migratory tree bats (Sjollema et al. 2014), with movements primarily during the fall. In the Mid-Atlantic, the maximum distance *Myotis* bats were detected offshore was 7.2 miles (11.5 kilometers) (Sjollema et al. 2014). A recent nano-tracking study on Martha's Vineyard recorded little brown bat movements off the island in late August and early September, with one individual flying from Martha's Vineyard to Cape Cod (Dowling et al. 2017). Big brown bats were also detected migrating from the island later in the year (October–November) (Dowling et al. 2017). These findings are supported by an acoustic study conducted on islands and buoys off the Gulf of Maine that indicated the greatest percentage of activity was in July–October (Peterson et al. 2014). Given that the use of the coastline as a migratory pathway by cave-hibernating bats is likely limited to their fall migration period, that acoustic studies indicate lower use of the offshore environment by cave-hibernating bats, and that cave-hibernating bats do not regularly feed on insects over the ocean, exposure to the NY Bight lease areas is unlikely for this group.

Tree bats migrate south to overwinter and have been documented in the offshore environment (Hatch et al. 2013). Eastern red bats have been detected migrating from Martha's Vineyard late in the fall, with one bat tracked as far south as Maryland (Dowling et al. 2017). These results are supported by historical observations of eastern red bats offshore and recent acoustic and survey results (Hatch et al. 2013; Peterson et al. 2014; Sjollema et al. 2014). While little data is available throughout all six NY Bight lease areas, there is some bat data collected by NYSERDA in Lease Areas OCS-A 0537 and OCS-A 0539. NYSERDA remote metocean data from one buoy (latitude 39.9692, longitude -72.7166) in NY Bight Lease Area OCS-A 0537 and one buoy (latitude 39.54677, longitude -73.4292) in NY Bight Lease Area OCS-A 0539 detected nine silver-haired bats and one unknown low-frequency bat between September 2019 and September 2022 (NYSERDA 2022). The buoy in Lease Area OCS-A 0539 detected three bats in September/October 2019 and no bats for the remaining years. The buoy in Lease Area OCS-A 0537 detected three bats in September 2019, one bat in August 2020, and two bats in October 2020; no bats were detected in the remaining time frame.

Closer to the New Jersey coast, and outside of the NY Bight lease areas, the NJDEP Ecological Baseline Studies (EBS) surveys recorded several observations of bats flying over the ocean (NJDEP 2010), with observations of migratory tree bats in the near-shore portion of the Ocean Wind 1 and Atlantic Shores North project lease areas off of New Jersey (Figure 3.5.1-2). In addition to the NJDEP EBS survey data, offshore acoustic bat surveys were conducted in 2020 and 2021 in Lease Area OCS-A 0499 (Atlantic Shores South), which is near the southern end of the NY Bight lease areas (Atlantic Shores 2022). Eastern red bat represented the most detections (495), followed by big brown/silver-haired bat group (478), silver-haired bat (80), hoary bat (37), big brown bat (26), tri-colored bat (5), and *Myotis* spp. (3). Overall, 1,124 total bat detections were identified to species or species group across the 180 survey nights in the Lease Area OCS-A 0499. This averages to 6.2 bat detections per detector-night, which is a small fraction of bat passage rates typically found onshore during migration in eastern North America. For a nearby onshore comparison, Johnson et al. (2011) found bat activity along the coast of Maryland to average 25 passes per detector-night over the span of an entire year. During fall migration, the number of bat passes there commonly exceeded 500 per detector-night and peaked around 1,000 (Johnson et al. 2011), compared to an average of only 6.2 bat passes per night in Lease Area OCS-A 0499 during a similar time of year. Further, recent offshore acoustic surveys recorded bats within Lease Area OCS-A 0512 (Empire Wind project; adjacent to one of the NY Bight lease areas), with observations primarily composed of eastern red bats and silver-haired bats, concentrated during fall migration. Big brown bats were documented infrequently in Lease Area OCS-A 0512, and hoary bats were also detected in the offshore environment, but closer to shore and not within Lease Area OCS-A 0512. Given that tree bats have been detected in the offshore environment, they may pass through the NY Bight lease areas during the migration period, although BOEM would anticipate even lower bat use of the NY Bight lease areas because these areas are even farther offshore on the OCS than the NJDEP EBS survey area, Atlantic Shores South, and Empire Wind survey area (as shown by the NYSERDA buoy data).

Onshore coastal areas throughout the geographic analysis area provide a variety of habitats that support a diversity of bat species. The New Jersey coast, where potential onshore export cables for the NY Bight lease areas would be constructed and operated, consists of a diverse set of habitats including coastal wetlands, forested wetlands, forested uplands, forested lowlands, barrier beaches, and bay island habitats that can support a diversity of bat species. Forested habitats can provide roosting areas for both migratory and non-migratory species. All bat species present in New Jersey (migratory and non-migratory) are known to utilize forested areas (of varying types) during summer for roosting and foraging. Some of these species roost solely in the foliage of trees, while others select dead and dying trees where they roost in peeling bark or inside crevices. Some species may select forest interior sites, while others prefer edge habitats. Caves and mines provide key habitat for non-migratory bats. These locations serve as winter hibernacula, fall swarm locations (areas where mating takes place in the fall months), and summer roosting locations for some individuals. Hibernacula are documented in New Jersey, but the numbers of individuals at the sites have declined dramatically because of the fungal disease white-nose syndrome (WNS) (New Jersey Division of Fish and Wildlife 2017). Overall, while both cave-hibernating and migratory tree bats may occur along the New Jersey coast, BOEM anticipates the onshore export cables to be mostly co-located with existing disturbed areas (e.g., roads, transmission lines) and substations and other facilities to be sited in previously disturbed areas.



Number of bat detections per month					
Bat Species	May	August	September	October	Total
Big brown bat/ Silver haired bat	1	3	1		5
Eastern red bat		17		2	19
Hoary bat		1			1
Myotis species		1	1	1	3
Unknown		15	6	4	25
Total	**1**	**37**	**8**	**7**	**53**

Figure 3.5.1-2. Bat occurrences in the NJDEP EBS

The New York coast, where potential onshore export cables could be constructed and operated for the NY Bight projects, consists primarily of highly urbanized environments and existing infrastructure with few natural habitat areas. Areas of New York City (e.g., the boroughs of Brooklyn and Queens) are highly developed with commercial, industrial, and residential development and are expected to provide little, if any, bat habitat. East of Queens, Long Island is still highly developed as part of the greater New York City metropolitan area, but more natural areas are present moving eastward, with isolated areas of shrub and forest habitats with little connectivity to larger habitat areas. These habitats may support bats for foraging and roosting during summer (i.e., foliage trees, dead and dying trees with peeling bark and crevices), but these areas are not expected to be important habitat for any species because they are typically isolated by surrounding developments. Hibernacula are documented in New York, but the numbers of individuals at the sites have declined dramatically because of WNS (Ingersoll et al. 2016; New Jersey Division of Fish and Wildlife 2017). Since 2011, WNS has substantially reduced *Myotis* bat populations in New York (New Jersey Division of Fish and Wildlife 2017). Therefore, the presence of both cave-hibernating and migratory tree bats that may occur along the western Long Island coast is expected to be minimal.

One bat species protected under the ESA may occur in the area where the NY Bight lease areas' onshore wind project components would likely be sited: the northern long-eared bat (USFWS 2021). It is not expected that northern long-eared bats will be present in the NY Bight lease areas themselves. A 2016 tracking study on Martha's Vineyard (July–October 2016) did not record any offshore movements (Dowling et al. 2017). If northern long-eared bats were to migrate over water, movements would likely be close to the mainland. The related little brown bat has been documented to migrate from Martha's Vineyard to Cape Cod, and northern long-eared bat may likewise migrate to mainland hibernacula from these islands in August–September (Dowling et al. 2017). Given that there is little evidence of use of the offshore environment by northern long-eared bats, exposure to the NY Bight lease areas, if it occurs, is anticipated to be minimal. On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation.

Cave bat species, including the northern long-eared bat, are experiencing drastic declines due to WNS. WNS has been confirmed present in every state in the geographic analysis area, except Florida (Whitenosesyndrome.org 2021). WNS was confirmed present in New York in 2006 and has killed large numbers of cave bats during hibernation—more than 90 percent at many sites (Whitenosesyndrome.org 2021). WNS was confirmed present in New Jersey in 2009 and, as in New York, has killed large numbers of cave bats during hibernation—more than 90 percent at many sites (Whitenosesyndrome.org 2021; New Jersey Division of Fish and Wildlife 2019). However, New Jersey's bat population appears to be stabilizing (New Jersey Division of Fish and Wildlife 2019). Development of the NY Bight lease areas, including onshore wind components (e.g., export cables) have the potential to affect cave bat populations already affected by WNS. The unprecedented mortality of more than 5.5 million bats in northeastern North America as of 2015 reduces the likelihood of many individuals being present within the onshore project area (USFWS 2015). However, given the drastic reduction in cave bat populations in the region, the biological significance of mortality resulting from offshore wind projects in the NY Bight lease areas, if any, may be increased.

3.5.1.2 Impact Level Definitions for Bats

Definitions of impact levels are provided in Table 3.5.1-2. Issues and indicators to assess impacts on bats are described using the definitions described in the Table 3.5.1-3.

Table 3.5.1-2. Impact level definitions for bats

Impact Level	Definition
Negligible	There would be no measurable impacts, or impacts would be so small that it is extremely difficult or impossible to discern or measure.
Minor	Most impacts could be avoided; if impacts occur, the loss of one or few individuals or temporary alteration of habitat could represent a minor impact, depending on the time of year and number of individuals involved.
Moderate	Impacts are unavoidable but would not result in population-level effects or threaten overall habitat function.
Major	Impacts would result in severe, long-term habitat or population-level effects on species.

Land disturbance, noise, and presence and operation and conceptual decommissioning of structures are contributing IPFs to impacts on bats. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.5.1-3.

Table 3.5.1-3. Issues and indicators to assess impacts on bats

Issue	Impact Indicator
Collision/attraction	Qualitative estimate of collision risk
Displacement/barrier effects/disturbance	Changes to noise levels Projected traffic patterns/volume changes
Habitat loss and modification	Area of suitable habitat removed or modified

3.5.1.3 Impacts of Alternative A – No Action – Bats

When analyzing the impacts of the No Action Alternative on bats, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for bats. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with the other planned non-offshore-wind and offshore wind activities, as described in Appendix D, *Planned Activities Scenario*. Separate impact conclusions are presented for both scenarios.

3.5.1.3.1 Impacts of the No Action Alternative

Under Alternative A, baseline conditions for bats described in Section 3.5.1.1, *Description of the Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends and respond to IPFs introduced by other ongoing activities. Ongoing activities within the geographic analysis area that contribute to impacts on bats are generally associated with onshore construction and climate change. Onshore construction activities and associated impacts are expected to continue at current trends and have the potential to affect bat species through temporary and permanent habitat removal and temporary noise impacts, which could cause avoidance behavior and displacement. Mortality of individual bats could occur, but population-level effects would not be anticipated. Impacts associated with climate change have the potential to reduce reproductive output and increase individual mortality and disease occurrence.

Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on bats are listed in Table 3.5.1-4. The effects of approved projects have been evaluated through previous NEPA review and are incorporated by reference. Ongoing O&M of the Block Island and Coastal Virginia Offshore Wind Pilot projects and ongoing construction of the Vineyard Wind 1 (OCS-A 0501), South Fork Wind (OCS-A 0517), Ocean Wind 1 (OCS-A 0498),Revolution Wind (OCS-A 0486), Sunrise Wind (OCS-A 0487), New England Wind (OCS-A 0534) Phase 1 and 2, Empire Wind (OCS-A 0512) 1 and 2, and CVOW-Commercial (OCS-A 0483) projects would affect bats through the primary IPFs of noise, presence of structures, and land disturbance. Ongoing offshore wind activities would have the same types of impacts from noise, presence of structures, and land disturbance that are described in detail in Section 3.5.1.3.3, *Cumulative Impacts of the No Action Alternative,* for planned offshore wind activities, but the impacts would be of lower intensity.

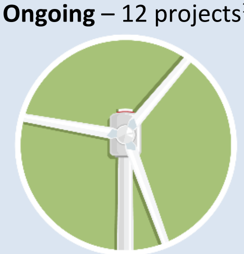
3.5.1.3.2 Impacts of the No Action Alternative on ESA-Listed Bats

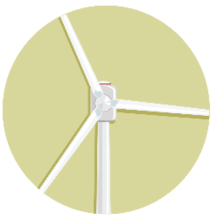
The federally endangered northern long-eared bat is the only bat species listed as threatened or endangered under the ESA that may be affected by offshore wind activities. As described below, northern long-eared bats are not expected to use the OCS in any significant numbers, if at all. The IPFs described previously for all bats would also apply to the northern long-eared bat. Any future federal activities that could affect the northern long-eared bat would need to comply with ESA Section 7 to ensure that proposed activities do not jeopardize the continued existence of the species. Future non-federal activities would be addressed under ESA Section 10 to ensure that proposed activities do not jeopardize the continued existence of the species.

3.5.1.3.3 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impact of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects). Table 3.5.1-4 lists the ongoing and planned offshore wind activities in the geographic analysis area for bats.

Table 3.5.1-4. Ongoing and planned offshore wind in the geographic analysis area for bats

Ongoing/Planned	Projects by Region
Ongoing – 12 projects[1] 	**MA/RI** • Block Island (State waters) • Vineyard Wind 1 (OCS-A 0501) • Revolution Wind (O CS-A 0486) • South Fork Wind (OCS-A 0517) • Sunrise Wind (OCS-A 0487) • New England Wind (OCS-A 0534) Phase 1 • New England Wind (OCS-A 0534) Phase 2

Ongoing/Planned	Projects by Region
	NY/NJ • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512) **VA/NC** • CVOW-Pilot (OCS-A 0497) • CVOW-Commercial (OCS-A 0483)
Planned – 18 projects[2] 	**MA/RI** • SouthCoast Wind (OCS-A 0521) • Beacon Wind 1 (OCS-A 0520) • Beacon Wind 2 (OCS-A 0520) • Bay State Wind (OCS-A 0500) • OCS-A 0500 remainder • OCS-A 0487 remainder • Vineyard Wind Northeast (OCS-A 0522) **NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499) **DE/MD** • Skipjack (OCS-A 0519) • US Wind/Maryland Offshore Wind (OCS-A 0490) • GSOE I (OCS-A 0482) • OCS-A 0519 remainder **VA/NC** • Kitty Hawk North (OCS-A 0508) • Kitty Hawk South (OCS-A 0508) **SC** • Duke Energy Renewables Wind (OCS-A 0546) • TotalEnergies Renewables (OCS-A 0545)

CVOW = Coastal Virginia Offshore Wind; DE = Delaware; GSOE = Garden State Offshore Energy; MA = Massachusetts; MD = Maryland; NC = North Carolina; NJ = New Jersey; NY = New York; RI = Rhode Island; SC = South Carolina; VA = Virginia

[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.

[2] Status as of September 20, 2024.

Other planned non-offshore-wind activities that may affect bats include new submarine cables, transmission systems (e.g., PBI) and pipelines, oil and gas activities, increasing onshore construction, marine minerals extraction, port expansions, and installation of new structures on the OCS (see Appendix D for a description of planned activities). These activities may result in temporary or permanent displacement and injury or mortality to individual bats, but population-level effects would not be expected.

The sections below summarize the potential impacts of other offshore wind activities on bats during construction and installation, O&M, and conceptual decommissioning of the projects. The federally listed northern long-eared bat is the only bat species listed under the ESA that may be affected by other offshore wind activities. Impacts on the northern long-eared bat would most likely be limited to onshore impacts, and generally during onshore facility construction.

Noise: Anthropogenic noise on the OCS associated with planned offshore wind development, including noise from pile-driving and construction activities, has the potential to affect bats on the OCS. Additionally, onshore construction noise has the potential to affect bats. BOEM anticipates that these impacts would be temporary and highly localized.

The construction of 1,682 WTGs and 48 OSSs associated with planned offshore wind projects on the Atlantic OCS would create noise and may temporarily affect some migrating tree bats, if conducted at night during spring or fall migration. The greatest impact of noise is likely to be caused by pile-driving activities during construction. Noise from pile-driving would likely occur during installation of foundations for offshore structures at a typical frequency of 4 to 6 hours at a time during construction. Construction activity would be temporary and highly localized. Auditory impacts are not expected to occur, as recent research has shown that bats may be less sensitive to temporary threshold shifts (TTS) than other terrestrial mammals (Simmons et al. 2016). Offshore habitat-related impacts (i.e., displacement from potentially suitable habitats) could occur as a result of construction activities, which could generate noise sufficient to cause avoidance behavior by individual migrating tree bats (Schaub et al. 2008). These impacts would likely be limited to behavioral avoidance of pile-driving or construction activity, and no temporary or permanent hearing loss would be expected (Simmons et al. 2016). However, these impacts are highly unlikely to occur, as use of the OCS by bats is limited, and only during spring and fall migration.

Some potential for temporary, localized habitat impacts arising from onshore construction noise exists; however, no auditory impacts on bats would be expected to occur. Recent literature suggests that bats are less susceptible to temporary or permanent hearing loss from exposure to intense sounds (Simmons et al. 2016). Nighttime work may be required on an as-needed basis. Some temporary displacement or avoidance of potentially suitable foraging habitat could occur, but these impacts would not be expected to be biologically significant. Some bats roosting in the vicinity of construction activities may be disturbed during construction but would be expected to move to a different roost farther from construction noise. This would not be expected to result in any impacts, as frequent roost switching is common among bats (Hann et al. 2017; Whitaker 1998).

Non-routine activities associated with the offshore wind facilities would generally require intense, temporary activity to address emergency conditions. The noise made by onshore construction equipment or offshore repair vessels could temporarily deter bats from approaching the site of a given non-routine event. Impacts on bats, if any, would be temporary and last only as long as repair or remediation activities were necessary to address these non-routine events.

Given the temporary and localized nature of potential impacts and the expected biologically insignificant response to those impacts, no individual fitness or population-level impacts would be expected to occur as a result of onshore or offshore noise associated with planned offshore wind development.

Presence of structures: Ongoing and planned offshore wind-related activities would account for up to 2,459 WTGs and 66 OSSs in the geographic analysis area, and the presence of these structures could result in potential long-term effects on bats. Cave bats (including the federally listed northern long-eared bat) do not tend to fly offshore (even during fall migration), and, therefore, exposure to construction vessels during construction or maintenance activities, or the rotor-swept zone (RSZ) of operating WTGs in the offshore wind lease areas, is expected to be negligible, if exposure occurs at all (BOEM 2015; Pelletier et al. 2013).

As discussed above tree bats may occur in the offshore marine environment (Cryan and Brown 2007; Dowling et al. 2017; Hatch et al. 2013; Pelletier et al. 2013) and potentially pass through the offshore wind lease areas during the fall migration; however, bat activity levels are generally lower offshore compared to onshore (Hein et al. 2021, Brabant et al. 2021). The low presence of bats in the offshore environment of the Atlantic OCS is further supported by multi-year post-construction bat monitoring at the existing Block Island Wind Farm (five wind turbines offshore Block Island, Rhode Island) and the Coastal Virginia Offshore Wind Pilot (two turbines offshore Virginia), as well as lease-area-specific bat surveys (e.g., Atlantic Shores and Empire Wind). These monitoring and survey results are summarized below.

- **Block Island Wind Farm (Stantec 2020):** Three years of post-construction bat monitoring with bat detectors deployed for 1,808 calendar nights from August 3, 2017, to February 4, 2020. Collectively, the detectors operated successfully for 1,707 detector-nights, during which time 2,294 bat passes were detected. The overall bat detection rate during the survey period (passes/detector-night) was 1.3. Detection rates were highest during August and September, with no bat passes recorded from December through April. Eastern red bats and silver-haired bats accounted for a combined 76.5 percent of the passes. Big brown and hoary bats comprised the majority of the remaining passes. Two passes identified as little brown bats were plausible, but the monitoring report notes that these could have been fragments of eastern red bat call sequences. No northern long-eared bats were detected.

- **Coastal Virginia Offshore Wind Pilot (Dominion Energy 2022):** Post-construction monitoring occurred from April 1 to June 15, 2021 (spring season); August 15 to October 31, 2021 (fall season); and January 15 to March 15, 2022 (winter season). Across all bat detection sensors during the entire three season monitoring period, there were 521 detections of bats. Only two bat detections occurred in the spring, and the remaining 519 occurred in the fall (mostly in September); no bats were detected in the winter. The detection rate for the fall season was 6.6 bats per detector-day. Slightly over half (56 percent) of detections occurred when turbine blades were spinning, and bats avoided collisions while foraging within the RSZ using microavoidance behavior. Bats detected included the silver-haired bat, hoary bat, and eastern red bat. No federally or state listed bat species were detected during the survey period.

- **Lease Area OCS-A 0499 (Atlantic Shores South [Atlantic Shores 2022]):** Offshore acoustic bat surveys were conducted in the lease area in 2020 and 2021. Overall, there were 1,124 total bat detections identified to species or species group across the 180 survey nights. This averages to

6.2 bat detections per detector-night. Detections occurred from July to October, with peak activity in August and September, and the latest detection occurring on November 1. Eastern red bat represented the most detections (495), followed by big brown/silver-haired bat group (478), silver-haired bat (80), hoary bat (37), big brown bat (26), tri-colored bat (5), and *Myotis* spp. (3).

- **Lease Area OCS-A 0512 (Empire Wind [TetraTech 2022]):** Offshore acoustic bat surveys were conducted in the lease area in 2018. Overall, there were 584 total bat detections identified to species level or frequency group across 188 survey nights. This averages to 3.1 bat detections per detector-night. There was a minimum of zero passes and a maximum of 133 passes recorded in a single night. Eastern red bat represented the most detections (229) followed by silver-haired bat (184), unidentified high frequency bat (133), unidentified low frequency bat (21), and big brown bat (17). Detection rates were highest in early August through early November.

These bat survey data indicate that bat presence in the offshore environment is a small fraction of bat passage rates typically found onshore during migration in eastern North America. For a nearby onshore comparison, Johnson et al. (2011) found bat activity along the coast of Maryland to average 25 passes per detector-night over the span of an entire year. During fall migration, the number of bat passes there commonly exceeded 500 per detector-night and peaked around 1,000 (Johnson et al. 2011), compared to an average of only 1.3 for Block Island Wind Farm, 6.6 for Coastal Virginia Offshore Wind Pilot, 6.2 in Lease Area OCS-A 0499 (Atlantic Shores South), and 3.1 in Lease Area OCS-A 0512 (Empire Wind) during a similar time of year. As another comparison, a recent study farther inland, along Lake Erie, reported an average of 155 bat passes per detector-night during the fall migration period of 2020 (Haddaway and McGuire 2022). As such, while some bats may fly offshore during migration, they appear to represent a very small percentage of their species' total population onshore. In addition to ongoing monitoring of the Block Island Wind Farm and Coastal Virginia Offshore Wind Pilot (summarized above), the Vineyard Wind 1 and South Fork Wind Farm projects have post-construction requirements to monitor bat activity, which will provide additional information to developers and agencies on bat activities near wind farms and to help minimize bat impacts.

Based on recent bat survey data on the Atlantic OCS (as described above), the limited number of tree bat species that may encounter the operating WTGs in the offshore wind lease areas would likely be composed of the eastern red bat, hoary bat, big brown bats, and silver-haired bat. Offshore O&M would present a seasonal risk factor to migratory tree bats that may utilize the offshore habitats during fall migration. While some potential exists for migrating tree bats to encounter operating WTGs during fall migration, the overall occurrence of bats on the OCS is relatively very low (as previously described). Additionally, unlike with terrestrial migration routes, there are no landscape features that would concentrate bats and thereby increase exposure to the offshore wind lease areas. There is some evidence that bats could use offshore structures to provide shelter from adverse weather or to rest after a long flight (Solick and Newman 2021), which could increase exposure and risk of collision with turbine blades. While bats have been found roosting in the nacelles of turbines close to shore (3.6 miles [5.8 kilometers]) in the Baltic Sea (Ahlén et al. 2009), given the low presence of bats offshore of New York and New Jersey and the farther distance of offshore wind projects from shore in the geographic analysis area, the potential for bats to roost on WTGs is expected to be low.

Given the expected infrequent and limited use of the OCS by migrating tree bats, very few individuals would be expected to encounter operating WTGs or other structures associated with offshore wind development. Further, with the typical spacing between many structures associated with planned offshore wind development being 0.6 to 1 nautical mile (1.1 to 1.9 kilometers) and the distribution of anticipated projects, the limited number of individual bats migrating over the OCS within the RSZ of project WTGs would likely pass through projects with only slight course corrections, if any, to avoid operating WTGs (Baerwald and Barclay 2009; Cryan and Barclay 2009; Fiedler 2004; Hamilton 2012; Smith and McWilliams 2016). As seen with some birds (Masden et al. 2012; Peschko et al. 2021), wide spacing between WTG rows is expected to reduce barrier effects by providing bats ample space to fly through wind farms while staying far away from the nearest WTG. As such, BOEM expects that adverse impacts of additional energy expenditure due to course corrections to avoid WTGs are not expected to be biologically significant. Furthermore, the potential collision risk to migrating tree bats differs with climatic conditions; for example, bat activity is associated with relatively low wind speeds and warm temperatures (Arnett et al. 2008; Cryan and Brown 2007; Fiedler 2004; Kerns et al. 2005). Post-construction acoustic and video monitoring of bats at the Coastal Virginia Offshore Wind Pilot Project from the spring of 2021 through winter of 2022 found bat activity to decline with increasing wind speed and no video evidence of collisions with the WTGs (Dominion Energy 2022). Given the relatively low numbers of tree bats in the offshore environment, the wide spacing of WTGs, and the intermittence of projects, the likelihood of collisions is expected to be low; therefore, impacts on bats would be negligible. Additionally, the likelihood of a migrating individual encountering one or more operating WTGs during adverse weather conditions is extremely low, as bats onshore and offshore have been shown to suppress activity during periods of strong winds, low temperatures, and rain (Arnett et al. 2008; Erickson et al. 2002; Sjollema et al. 2014; Dominion Energy 2022).

Land disturbance: Construction of onshore power infrastructure would be required to connect offshore wind energy projects to the electrical grid. Typically, this would require only small amounts of habitat removal, if any, and would occur in previously disturbed areas. Transmission infrastructure, such as PBI, would likely be primarily co-located with existing roads and rights-of-way. However, the conversion of habitat would likely still occur. PBI would potentially have an impact on 2 acres of wetland (including forested wetland) habitat and 4 acres of forest (deciduous, evergreen, and mixed) habitat. Habitat and/or species surveys may be conducted in accordance with federal and state requirements to support federal and state agency consultation and permitting requirements, and consultation and permitting may require that construction activities be seasonally restricted to occur when bats are inactive. Short-term and long-term impacts associated with habitat loss or avoidance during construction may occur, but no injury or mortality of individuals would be expected. As such, onshore construction activities associated with offshore wind development would not be expected to appreciably contribute to overall impacts on bats.

In addition to electrical infrastructure, some amount of habitat conversion may result from port expansion activities required to meet the demands for fabrication, construction, transportation, and installation of wind energy structures. The general trend along the coastal region from Virginia to Maine points to port activity increasing modestly, requiring some conversion of undeveloped land to meet port demand. This conversion would result in permanent habitat loss for local bat populations. However, the increase from planned offshore wind development would be a minimal contribution in the port expansion required to meet increased commercial, industrial, and recreational demand.

3.5.1.3.4 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, bats would continue to be affected by existing environmental trends and ongoing activities. BOEM expects ongoing activities to have continuing temporary, long-term, and permanent impacts (disturbance, displacement, injury, mortality, and habitat conversion) on bats primarily through onshore construction impacts, the presence of structures, and climate change. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration and given that cave bats do not typically occur on the OCS, ongoing offshore wind activities would not appreciably contribute to impacts on bats. Temporary disturbance and permanent loss of habitat onshore may occur as a result of ongoing offshore wind development. However, habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the geographic analysis area. The No Action Alternative would likely result in **negligible** impacts on bats.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and bats would continue to be affected by natural and human-caused IPFs. Planned activities would contribute to the impacts on bats due to habitat loss from increased onshore construction. In the offshore environment, impacts are anticipated to be negligible because bat presence on the OCS is anticipated to be limited. Impacts on onshore bat habitat are expected to be negligible to minor, depending on the amount and quality of forest habitat removed. Overall, BOEM anticipates cumulative impacts of the No Action Alternative would likely be **negligible** to **minor.**

3.5.1.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Bats

3.5.1.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Noise: Pile-driving noise and onshore and offshore construction noise associated with a single NY Bight project is expected to result in temporary and highly localized impacts. Auditory impacts are not expected to occur, as recent research has shown that bats may be less sensitive to TTS than other terrestrial mammals (Simmons et al. 2016). Impacts, if any, are expected to be limited to behavioral avoidance of pile-driving or construction activity, and no temporary or permanent hearing loss would be expected (Simmons et al. 2016).

Presence of structures: The various types of impacts on bats that could result from the presence of structures, such as migration disturbance and turbine strikes, are described in detail in *Cumulative Impacts of the No Action Alternative*. Between 50 and 280 WTGs and 1 and 5 OSSs on the OCS would result from one NY Bight project where few currently exist. The structures, and related bat impacts, associated with one NY Bight project would remain at least until conceptual decommissioning of the project is complete and could pose long-term effects on bats.

Migratory tree bats have the potential to pass through the NY Bight lease areas and be exposed to structures, but, overall, a small number of bats is expected in the lease areas given their distance from shore and low occurrence on the OCS. As detailed in Section 3.5.1.3.3, *Cumulative Impacts of the No Action Alternative* section, and Section 3.5.1.1, *Description of the Affected Environment and Future Baseline Conditions*, bat surveys (in lease areas on the OCS), buoy data on the OCS, and recent bat monitoring at existing wind turbines on the OCS, indicate that bats are generally absent on the OCS during most of the year, with very limited presence typically during the late summer/fall months (August–October). Compared to bat presence in the onshore environment, bat presence offshore represents a very small percentage of bat species' total population onshore. The NY Bight lease areas are also farther offshore on the OCS compared to most other projects (like Ocean Wind 1 [OCS-A 0498] and Atlantic Shores South [OCS-A 0499]), and BOEM anticipates that bat numbers would be even lower due to distance. Therefore, because available information and bat survey data on the OCS indicate bat presence on the OCS is limited in both numbers and time of year, BOEM anticipates the presence of structures would have a negligible impact on bat populations.

Land disturbance: Impacts associated with construction of onshore elements of a single NY Bight project could occur if construction activities take place during the active season (generally April through October), and may result in injury or mortality of individuals, particularly juveniles who are unable to flush from a roost, if occupied by bats at the time of removal. There would be some potential for habitat impacts on bats as a result of the loss of potentially suitable roosting or foraging habitat. However, BOEM anticipates that impacts on bat habitat from onshore construction activities would be limited because, based on recent proposed offshore wind projects, whenever possible, facilities (including overhead transmission lines) would be co-located with existing developed areas (i.e., roads and existing transmission lines) to limit disturbance. In addition, New York State restricts tree clearing from March through November on Long Island. Where necessary, construction of onshore facilities may require clearing and some permanent removal of some trees along the edge of the construction corridor. Any habitat that may be present within permanent substation/converter station sites or other permanent facilities would be converted to developed land with landscaping for the duration of the NY Bight project's operational lifetime, which would be considered a long-term effect. While BOEM anticipates tree clearing to be minimal due to the likely placement of onshore project components in previously disturbed areas and adherence to requirements to minimize impacts identified through state permitting and ESA consultation, it is possible that areas of forest that support bats could be temporarily and permanently cleared depending on the siting of the NY Bight project's onshore components. Disturbance to the land surface or terrestrial habitat during the course of conceptual decommissioning would be minimal, such as disconnecting and cutting buried cables at the fence site below ground.

Applicants could also leave some onshore facilities in place for future use. Therefore, onshore temporary impacts of conceptual decommissioning would be negligible. Overall, BOEM anticipates habitat loss would be limited, and any potential effects would be indirect and unlikely to affect individual or population levels of bat species. However, the area of suitable bat habitat removed could vary, depending on the specific siting of the onshore project components.

3.5.1.4.2 Impacts of Six Projects

The same noise and presence of structure IPF impact types and mechanisms described under one NY Bight project apply to six NY Bight projects. There would be more potential for impacts for these IPFs due to the greater amount of offshore and onshore development under six NY Bight projects. However, noise impacts are still expected to be minimal because noise has limited effects on bats (see Section 3.5.1.4.1, *Impacts of One Project*), and a greater number of offshore structures are unlikely to change the intensity of the impact because bat presence on the OCS is low. Therefore, noise impacts and offshore structures under six NY Bight projects are anticipated to have negligible impacts on bats.

The same land disturbance IPF impact types and mechanisms described under one NY Bight project apply to six NY Bight projects. Similar to a single NY Bight project, the level of impact of bats from land disturbance depends on the amount of bat habitat affected from the onshore project components, particularly forest habitat. While BOEM anticipates that impacts on bat habitat from onshore construction activities under six NY Bight projects would be limited, it is possible that areas of forest that support bats could be temporarily and permanently cleared. Under six NY Bight projects, the potential for this possibility would be greater compared to one NY Bight project due to the increased amount of offshore wind development that would occur.

3.5.1.4.3 Impacts of Alternative B on ESA-Listed Bats

As stated previously, the presence of northern long-eared bat on the offshore environment would generally be limited, and there would be more potential effects from onshore activities. On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation.

3.5.1.4.4 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of both onshore and offshore infrastructure for offshore wind activities across the geographic analysis area would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Given that the use of the OCS by migrating tree bats during spring and fall migration is anticipated to be infrequent and limited and given that cave bats do not typically occur on the OCS, offshore wind activities would not appreciably contribute to impacts on bats. Temporary disturbance and permanent loss of onshore habitat may occur as a result of constructing onshore infrastructure such as onshore substations and onshore export cables for offshore wind development. Any habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the geographic analysis area. However, the area of suitable bat habitat removed could vary, depending on the specific siting of the onshore project components.

The cumulative impacts on bats would likely be negligible in the offshore environment because the occurrence of bats offshore is low. This conclusion would not change even if all six of the individual NY Bight projects are constructed all at once or staggered. Onshore habitat loss is expected to be minimal and would result in negligible impacts, but a greater area of habitat loss could result in increased impacts. If construction of the onshore components of the projects is staggered, then there could be less of an effect on bats in the short term than if all six NY Bight projects were constructed at once. In the context of reasonably foreseeable environmental trends, BOEM anticipates the contribution of impacts of six NY Bight projects to the cumulative noise, presence of structures, and land disturbance impacts on bats would be undetectable.

3.5.1.4.5 Conclusions

Impacts of Alternative B. Construction, installation, and conceptual decommissioning of Alternative B, whether one NY Bight project or six NY Bight projects, would likely have **negligible** to **minor** impacts on bats, depending on the amount and quality of forest habitat removed. The main significant risk would be from operation of the offshore WTGs and potential onshore removal of habitat, which could lead to long-term impacts in the form of mortality, although BOEM anticipates this to be rare due to limited bat presence on the OCS in both numbers and time of year. Noise effects from construction are expected to be limited to temporary and localized behavioral avoidance that would cease once construction is complete.

Cumulative Impacts of Alternative B. BOEM anticipates that the cumulative impacts on bats in the geographic analysis area would likely be **negligible** to **minor** under six NY Bight projects. In context of reasonably foreseeable environmental trends, the impact of six NY Bight projects to the cumulative impacts on bats would be undetectable. Because the occurrence of bats offshore is low, six NY Bight projects would contribute to the cumulative impacts primarily through the long-term impacts from onshore habitat loss related to onshore substations and cables.

3.5.1.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Bats

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.5.1.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations (Table 3.5.1-5).

Table 3.5.1-5. Summary of previously applied avoidance, minimization, mitigation, and monitoring measures for bats

Measure ID	Measure Summary
BB-1	This measure proposes requiring that any occurrence of dead or injured ESA-listed birds or bats be reported as soon as practicable, which would improve the understanding of ESA-listed bat interactions with wind farms.
BB-2	This measure proposes annual reporting requirements for dead or injured birds or bats, which would improve the overall understanding of bat interactions with wind farms.
BB-3	This measure proposes lessees prepare and implement a Bird and Bat Post-Construction Monitoring Plan, which would include monitoring, reporting requirements, and adaptive management to reduce impacts on bats from offshore wind farms.

Impacts of One Project

The identification of AMMM measures under Sub-alternative C1 could potentially reduce impacts on bats compared to those under Alternative B for the presence of structures IPF. Impacts for other IPFs would remain the same as described under Alternative B.

Presence of structures: Development and implementation of a *Bird and Bat Post-Construction Monitoring Plan* (BB-3) would support advancement of the understanding of bat interactions with offshore wind farms through monitoring, reporting requirements, and adaptive management. Depending on the results of the post-construction monitoring, new mitigation and monitoring measures may be required by BOEM if impacts on bats in the offshore environment deviate substantially from the impact analysis. The immediate reporting of dead or injured ESA-listed bats and annual reporting of any dead or injured bats would improve overall understanding of bat interactions with offshore wind and may reduce overall impacts on bats over time (BB-1, BB-2). Dead bat reporting could also lead to new mitigation or monitoring methods to reduce impacts on bats.

Overall, while the identification of the AMMM measures under Sub-alternative C1 for this IPF could reduce impacts on bats, BOEM anticipates the impacts from presence of structures from one project in the NY Bight lease areas would be similar to Alternative B and remain negligible. This impact determination is primarily based on the current understanding that bat presence in the offshore environment is low.

Impacts of Six Projects

The same IPF impact types and mechanisms described under one NY Bight project apply to six NY Bight projects. AMMM measures identified under Sub-alternative C1 for six NY Bight projects could similarly reduce impacts on bats as described for a single NY Bight project, but the benefits would apply to more projects and cover a large geographic extent. However, because presence of bats on the OCS is low and because bat habitat impacts in the onshore environment are unknown, the potential impacts on bats for six NY Bight projects under Sub-alternative C1 compared to one NY Bight project are not anticipated to be substantially different. For the same reasons, the potential impacts on bats for six NY Bight projects under Sub-alternative C1 compared to six NY Bight projects under Alternative B are not anticipated to be substantially different and remain negligible to minor.

Impacts of Sub-alternative C1 (Preferred Alternative) on ESA-Listed Bats

The identification of AMMM measures would result in similar reductions in impacts for ESA-listed bats as described for all bats for one NY Bight project and six NY Bight projects, with the exception of AMMM measure BB-1, which is designed specifically to mitigate impacts on ESA-listed bats. BB-1 would improve the understanding of ESA-listed bat interactions with WTGs through immediate reporting requirements. The northern long-eared bat is the only bat species listed as threatened or endangered under the ESA that may be affected by Sub-alternative C1. As stated previously, the presence of northern long-eared bat in the offshore environment would generally be limited, with more potential effects from onshore activities.

Cumulative Impacts of Sub-alternative C1 (Preferred Alternative)

Similar to Alternative B, the cumulative impacts on bats under Sub-alternative C1 would likely be negligible in the offshore environment because the occurrence of bats offshore is low. Onshore habitat loss may be reduced if lessees design the onshore project components to avoid sensitive onshore bat habitat, but there is still the possibility of larger habitat areas removed, which could result in potential minor impacts from land disturbance. In context of reasonably foreseeable environmental trends, the impacts of Sub-alternative C1 to the cumulative noise, presence of structures, and land disturbance impacts on bats would be undetectable.

3.5.1.5.2 Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any AMMM measures that have not been previously applied for bats, and, therefore, the impacts on bats under Sub-alternative C2 are the same as Sub-alternative C1.

3.5.1.5.3 Conclusions

Impacts of Alternative C. Construction, installation, and conceptual decommissioning of the NY Bight projects under Sub-alternative C1 or Sub-alternative C2, whether one NY Bight project or six NY Bight projects, would likely have **negligible** to **minor** impacts on bats, depending on the amount and quality of forest habitat removed. The AMMM measures under Sub-alternative C1 and Sub-alternative C2 would provide some certainty in reducing impacts on bats in the offshore environment and, therefore, could reduce potential impacts on bats compared to Alternative B. However, bat presence in the offshore environment is low and generally limited to a few months out of the year, and the AMMM measures may not significantly reduce impacts. Onshore habitat impacts under Sub-alternative C1 and Sub-alternative C2 could be reduced by lessees designing the projects to avoid onshore bat habitat. However, because the location of onshore infrastructure is not known, there could still be a range of potential impacts on habitat regardless of the AMMM measures, resulting in **negligible** to **minor** impacts. Noise effects from construction are expected to be limited to temporary and localized behavioral avoidance that would cease once construction is complete.

Cumulative Impacts of Alternative C. BOEM anticipates that the cumulative impacts on bats in the geographic analysis area would likely be **negligible** to **minor** for six NY Bight projects. In context of reasonably foreseeable environmental trends, the impacts contributed by Sub-alternative C1 and Sub-alternative C2 to the cumulative impacts on bats would be undetectable. Because the occurrence of bats offshore is low, Sub-alternative C1 and Sub-alternative C2 would contribute to the cumulative impacts primarily through the long-term impacts from onshore habitat loss related to onshore construction. If the lessees design onshore project components to avoid bat habitat there may be reduced bat impacts onshore, but the extent of this reduction cannot be known at this time.

3.5.1.6 Recommended Practices for Consideration at the Project-Specific Stage

In addition to the AMMM measures identified under Alternative C, BOEM is recommending lessees consider analyzing the RPs in Table 3.5.1-6 to further reduce potential bat impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.5.1-6. Recommended Practices for bat impacts and related benefits

Recommended Practice	Potential Benefit
BB-4: Prepare a framework for a *Bird and Bat Post-Construction Monitoring Plan* to be submitted with the COP.	Developing a framework for a *Bird and Bat Post-Construction Monitoring Plan* would provide the public and agencies an opportunity to provide early feedback on the plan.
MUL-5: Use equipment, technology, and best practices to produce the least amount of noise possible to reduce noise impacts.	Using noise reduction measures to produce the least amount of noise practicable would likely minimize disturbance/displacement impacts.
MUL-21: Use the best available technology, including new and emerging technology, when possible, to reduce impacts, such as the use of MERLIN radar systems.	Assessing and monitoring bat mortality risk through radar sensors and avian-detection software (e.g., MERLIN) would provide information on avian occurrence in a wind farm area and could be used to inform post-construction operational mitigation.
MUL-23: Avoid or reduce potential impacts on important environmental resources by adjusting project design, which may minimize impacts on bats associated with onshore activities.	Adjusting project design to minimize impacts, such as routing cable in previously disturbed areas, has the potential to reduce impacts on individual bats and their habitats from onshore activities.
MUL-25: Use consistent turbine grid layouts, markings, and lighting in lease areas. Turbines should have one of the two lines of orientation in the grid layout spaced at least 1 nm apart.	Providing more structure-free areas in the lease area and reducing the total number of structures would potentially reduce interactions between bats and WTGs.

Recommended Practice	Potential Benefit
MUL-26: Coordinate regional monitoring and surveys.	Coordinating monitoring and survey efforts across lease areas in the NY Bight to standardize approaches would contribute to understanding potential impacts to bats at a regional scale.

3.5 Biological Resources

3.5.3 Birds

This section discusses potential impacts on bird resources from the Proposed Action, alternatives, and ongoing and planned activities in the geographic analysis area for birds. The geographic analysis area for birds, as shown on Figure 3.5.3-1, includes the United States coastline from Maine to Florida, extending 100 miles (161 kilometers) offshore and 0.5 mile (0.8 kilometer) inland to capture the movement range for species in this group. The geographic analysis area for birds was established to capture resident species and migratory species that winter as far south as South America and the Caribbean, and those that breed in the Arctic or along the Atlantic Coast that travel through the area. The offshore limit was established to cover the migratory movement of most species in this group. The onshore limit was established to cover onshore habitats used by the species that may be affected by onshore and offshore components of the NY Bight projects.

The bird impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Because the locations of onshore components for the NY Bight projects are not known at this time, the analysis of onshore bird impacts is dependent on a hypothetical project analysis, and impact conclusions consider a maximum-case scenario for onshore development. Additional detailed site-specific analysis will be required for individual COPs. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

3.5.3.1 Description of the Affected Environment and Future Baseline Conditions

This section discusses bird species that use offshore and onshore habitats, including both resident bird species that use the NY Bight lease areas during all (or portions of) the year and migrating bird species with the potential to pass through the lease areas during fall migration, spring migration, or both. Given the differences in life history characteristics and habitat use between offshore and onshore bird species, the following discusses each group separately. This section also discusses bald and golden eagles, and addresses federally listed threatened and endangered birds, which are further addressed as part of the Programmatic Framework ESA Section 7 consultation that BOEM initiated with the USFWS on June 20, 2024.

The Mid-Atlantic Coast plays an important role in the ecology of many bird species. The Atlantic Flyway, which follows the Atlantic Coast, is an important migratory route for many bird species moving from breeding grounds in New England and eastern Canada to winter habitats in North, Central, and South America. Bays, beaches, coastal forests, marshes, and wetlands provide important stopover and foraging habitat for migrating birds (MMS 2007). Section 4.2.4 of the Atlantic OCS Proposed Geological and Geophysical Activities Programmatic EIS (BOEM 2014a) discusses the use of the Atlantic Coast habitats by migratory birds.

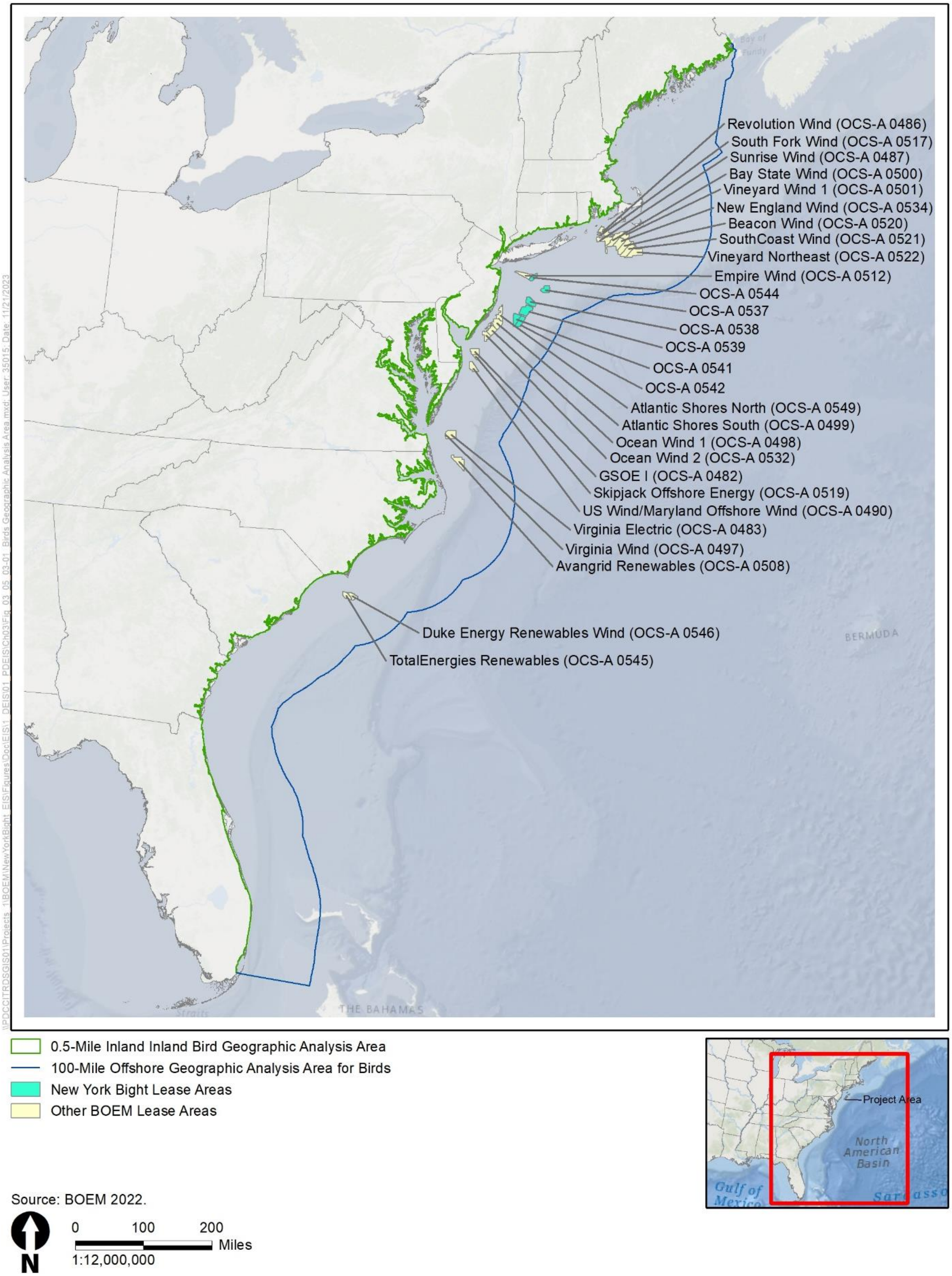


Figure 3.5.3-1. Bird geographic analysis area

Birds in the geographic analysis area are subject to pressure from ongoing activities, such as onshore construction, marine minerals extraction, port expansions, and installation of new structures in the OCS, but particularly from accidental releases; new cable, transmission line, and pipeline emplacement; interactions with fisheries and fishing gear; and climate change. More than one-third of bird species that occur in North America (37 percent, 432 species) are at risk of extinction unless significant conservation actions are taken (NABCI 2016). This is likely representative of the conditions of birds within the geographic analysis area. Species that live or migrate through the Atlantic Flyway have historically been, and will continue to be, subject to a variety of ongoing anthropogenic stressors—including hunting pressure (approximately 86,000 seaducks are harvested annually [Roberts 2019]), commercial fisheries by-catch (approximately 2,600 seabirds are killed annually on the Atlantic [Hatch 2017; Sigourney et al. 2019]), and climate change—which may have adverse impacts on bird species. Additional protections for migratory birds are provided through the Migratory Bird Treaty Act of 1918 (MBTA), which makes it illegal to "take" migratory birds, their eggs, feathers, or nests. The official list of migratory birds protected under the MBTA, and the international treaties that the MBTA implements, is found at 50 CFR 10.13.

According to the North American Bird Conservation Initiative (NABCI), more than half of the offshore bird species (57 percent, 31 species) have been placed on the NABCI watch list as a result of small ranges, small and declining populations, and threats to required habitats. This watch list identified species of high conservation concern based upon high vulnerability to a variety of factors, including population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trends (NABCI 2016). Globally, monitored offshore bird populations have declined by nearly 70 percent from 1950 to 2010, which may be representative of the overall population trend of seabirds (Paleczny et al. 2015) including those that forage, breed, and migrate over the Atlantic OCS. Overall, offshore bird populations are decreasing; however, considerable differences in population trajectories of offshore bird families have been documented.

Coastal birds, especially those that nest in coastal marshes and other low-elevation habitats, are vulnerable to sea level rise and the increasing frequency of strong storms as a result of global climate change. According to NABCI, nearly 40 percent of the more than 100 bird species that rely on coastal habitats for breeding or for migration are on the NABCI watch list. Many of these coastal species have small population sizes or restricted distributions, making them especially vulnerable to habitat loss/degradation and other stressors (NABCI 2016). Some of the main drivers of threats to birds include habitat loss, habitat fragmentation, collisions with glass windows and power lines, invasive species, predators, toxic chemicals, and climate change (USFWS 2021a).

Marine-Life Data and Analysis Team (MDAT) marine bird models have been developed to describe regional-scale patterns of bird abundance (Curtice et al. 2016; Winship et al. 2018), including on U.S. Atlantic waters. The MDAT analysis integrates survey data (1978–2016) from the Atlantic Offshore Seabird Dataset Catalog with a range of environmental variables to produce long-term average annual and seasonal models. These models were recently updated by Winship et al. (2023) to include monthly predictions of relative abundance for 49 species from more recent survey data. Like the previous MDAT model, the updated models are based on data collected at much larger geographic and temporal scales than a survey for a particular area (e.g., a digital aerial survey of a lease area) and data that were also collected using a range of survey methods. The larger geographic scale is helpful for determining the importance of the NY Bight lease areas to marine birds relative to other available locations in the Northwest Atlantic and is thus important for determining overall exposure of birds to offshore wind lease areas. Limitations of the model data are described in detail in Winship et al. (2023). Figure 3.5.3-2 shows the MDAT model for total marine avian relative annual abundance distribution in U.S. Atlantic waters and indicates an overall low abundance of birds on the OCS, with much higher abundances along the nearshore areas of the coastline. Table 3.5.3-1 shows the annual percentage of the 49 marine avian species populations that overlap with anticipated offshore wind energy development on the OCS, which indicates that only a small percentage of a species' population would potentially occur in the wind development areas during annual migration. Overall, the MDAT models indicate marine bird presence on the OCS is low, including in the NY Bight lease areas.

NYSERDA conducted four aerial digital surveys for avian and marine wildlife between 2018 and 2019 in the NY Bight area, including surveys in summer 2018 (6 days in August), fall 2018 (4 days in November/December), winter 2018–2019 (3 days in February), and spring 2019 (2 days in April) (NYSERDA 2022). The aerial data provide coverage for all of four NY Bight lease areas (OCS-A 0537, OCS-A 0538, OCS-A 0539, and OCS-A 0544), a portion of OCS-A 0542, and none of OCS-A 0541 (Appendix B, *Supplemental Information and Additional Figures and Tables,* Figure B.2-1). The three most common avian species observed during the surveys were the red phalarope (*Phalaropus fulicarius*), Bonaparte's gull (*Chroicocephalus philadelphia*), and an unknown large shearwater-species.

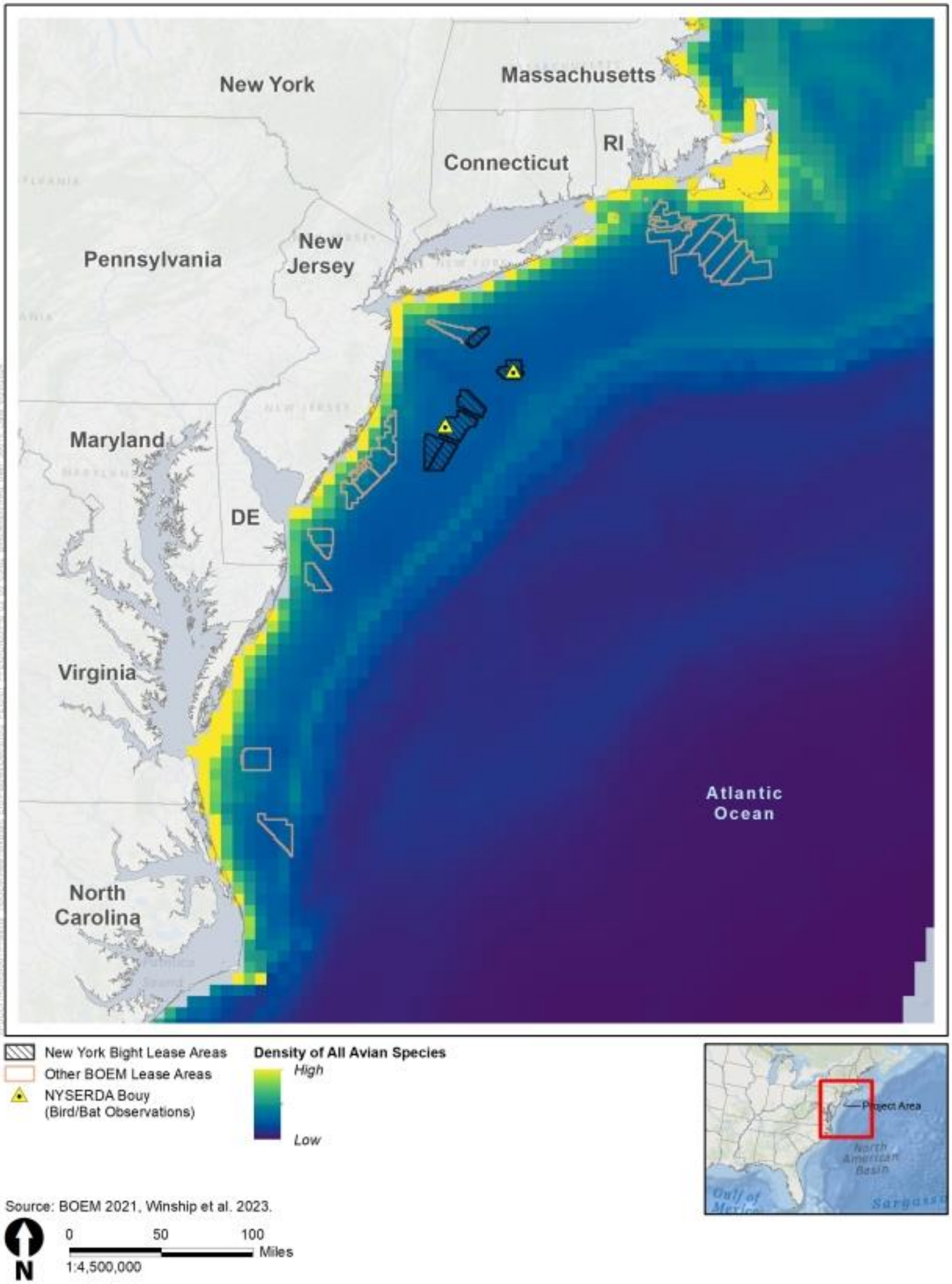


Figure 3.5.3-2. Total avian relative annual abundance distribution map

Table 3.5.3-1. Annual percentage of Atlantic seabird population (1993–2019) that overlaps with anticipated offshore wind energy development on the OCS

Species	Population %	Species	Population %
Artic Tern (*Sterna paradisaea*)	0.97	Long-tailed Ducks (*Clangula hyemalis*)	2.90
Atlantic Puffin (*Fratercula arctica*)	1.10	Manx Shearwater (*Puffinus puffinus*)[1]	1.00
Audubon Shearwater (*Puffinus lherminieri*)[1]	0.08	Northern Fulmar (*Fulmarus glacialis*)	0.63
Black-capped Petrel (*Pterodroma hasitata*)[1]	0	Northern Gannet (*Morus bassanus*)	2.50
Black Guillemot (*Cepphus grille*)	0.64	Parasitic Jaeger (*Stercorarius parasiticus*)	1.40
Black-legged Kittiwake (*Rissa tridactyla*)	2.30	Pomarine Jaeger (*Stercorarius pomarinus*)	0.81
Black Scoter (*Melanitta americana*)	0.92	Razorbill (*Alca torda*)	1.90
Bonaparte's Gull (*Chroicocephalus philadelphia*)	2.80	Ring-billed Gull (*Larus delawarensis*)	0.93
Brown Pelican (*Pelecanus occidentalis*)	0.07	Red-breasted Merganser (*Mergus serrator*)	1.00
Band-rumped Storm-Petrel (*Oceanodroma castro*)[1]	0.03	Red Phalarope (*Phalaropus fulicarius*)	0.89
Common Eider (*Somateria mollissima*)	0.60	Red-necked Phalarope (*Phalaropus lobatus*)	0.73
Common Loon (*Gavia immer*)	4.10	Roseate Tern (*Sterna dougallii*)	1.60
Common Murre (*Uria aalge*)	1.40	Royal Tern (*Thalasseus maximus*)	0.20
Common Tern (*Sterna hirundo*)	1.10	Red-throated Loon (*Gavia stellate*)	2.70
Cory's Shearwater (*Calonectris borealis*)[1]	0.59	Sooty Shearwater (*Ardenna grisea*)	1.10
Double-crested Cormorant (*Phalacrocorax auritus*)	1.40	Sooty Tern (*Onychoprion fuscatus*)	0.03
Dovekie (*Alle alle*)	1.80	South Polar Skua (*Stercorarius maccormicki*)	1.50
Great Black-backed Gull (*Larus marinus*)	1.30	Surf Scoter (*Melanitta perspicillata*)	1.50
Great Shearwater (*Puffinus gravis*)	0.70	Thick-billed Murre (*Uria lomvia*)	0.57
Great Skua (*Stercorarius skua*)	1.60	Wilson's Storm-Petrel (*Oceanites oceanicus*)	0.79
Herring Gull (*Larus argentatus*)	1.30	White-winged Scoter (*Melanitta deglandi*)	3.30
Horned Grebe (*Podiceps auritus*)	1.50	Lesser Black-backed Gull	1.50
Laughing Gull (*Leucophaeus atricilla*)	0.88	Black Tern (*Chlidonias niger*)[1]	0.91
Leach's Storm-Petrel (*Oceanodroma leucorhoa*)	0.13	Forster's Tern (*Sterna forsteri*)	2.40
Least Tern (*Sternula antillarum*)[1]	0.11		

Source: calculated into percentages from Appendix H in Winship et al. (2023).
[1] Species considered Birds of Conservation Concern in Bird Conservation Regions M16, M18, and M19 by USFWS (2021b).

Appendix B, Table B.2-1 identifies the number of observations by species and by lease area from the NYSERDA aerial surveys. Two meteorological buoys deployed by NYSERDA, and located within Lease Areas OCS-A 0537 and OCS-A 0539, have been used to collect avian data. The buoys include nanotag antennas that provide species-specific information gleaned from tagged birds, as well as bird acoustic sensors that constantly record diurnal and nocturnal bird calls. The two buoys detected 215 bird passes, consisting of nine species, between September 2019 and September 2022 (Normandeau Associates Inc. 2022). The most common bird detected at both buoys was the herring gull (*Larus argentatus smithsonianus*), with a total of 203 total pass observations, or 94 percent of all birds passes detected. The remaining 6 percent of birds detected at one or both buoys included American redstart, green heron, least bittern, palm warbler, ring-billed gull, white-throated sparrow, wood thrush, and yellow warbler (refer to Appendix B, Table B.2-2 for full percentages of the species observed).

Satellite telemetry datasets from the Northeast Ocean Data Portal show fine-scale use and movement patterns from three species of diving bird—including the surf scoter (*Melanitta perspicillata*), red-throated loon (*Gavia stellata*), and northern gannet (*Morus bassanus*), over the course of 5 years. The data that was collected represents the utilization distributions for each species throughout the Mid-Atlantic U.S. waters during different times of the year. The utilization distributions represent the probability that an animal will occur within a specific area during a specified time of year. The surf scoter and red-throated loon are less active within the geographic analysis area during fall migration and overwinter distribution, but heavily utilize the Mid-Atlantic Flyway during spring migration. In contrast, the northern gannet utilizes the Mid-Atlantic Flyway and passes through the geographic analysis area year-round for foraging and migration (Northeast Ocean Data Portal 2022; Appendix B, Figures B.2-2, B.2-3, and B.2-4).

Table 3.5.3-2 briefly describes the bird presence in the offshore project area by bird group based on information from other offshore lease areas (e.g., Empire Wind OCS-A 0512, Ocean Wind 1 OCS-A 0498, Atlantic Shores South OCS-A 0499). The table breaks down birds into six groups—shorebirds, wading birds, raptors, songbirds, coastal waterbirds, and marine birds. Marine birds are broken down further by family group.

Table 3.5.3-2. Bird presence in the offshore project area by bird group

Bird Group	Potential Bird Presence in the Offshore Project Area
Shorebirds	Shorebirds (e.g., black-bellied plover, semipalmated plover) are typically coastal breeders and foragers and generally avoid straying out over deep waters during breeding. Primarily, exposure of shorebirds to the offshore infrastructure would be limited to the spring and fall migration periods.
Wading Birds	Most long-legged wading birds, such as herons and egrets, breed and migrate in coastal and inland areas. Like the smaller shorebirds, wading birds are believed to avoid straying out over deep waters but may fly offshore during spring and fall migration periods.
Raptors	The degree to which raptors might occur offshore is dictated primarily by their morphology and flight strategy (i.e., flapping versus soaring), which influences species' ability or willingness to cross large expanses of open water where thermal formation is poor (Kerlinger 1985). Among raptors, falcons are the most likely to be encountered in offshore settings along the Atlantic Flyway (DeSorbo et al. 2012, 2018). Merlins are the most abundant diurnal raptor observed at offshore islands during migration. Both have been observed offshore on vessels and offshore oil platforms considerable distances from shore.
Songbirds	Songbirds (e.g., warblers, sparrows) almost exclusively use terrestrial, freshwater, and coastal habitats and do not use the offshore marine system except during migration. Many North American breeding songbirds migrate to the tropical regions, many in flocks. On their

Bird Group	Potential Bird Presence in the Offshore Project Area
	migrations, neotropical migrants generally travel at night and at high altitudes where favorable winds can aid them along their trip. Songbirds regularly cross large bodies of water (Bruderer and Lietchi 1999; Gauthreaux and Belser 1999), and there is some evidence that species migrate over the northern Atlantic (Adams et al. 2015). Some birds may briefly fly over the water while others, like the blackpoll warbler, are known to migrate over vast expanses of ocean (Faaborg et al. 2010; DeLuca et al. 2015). Evidence for a variety of species suggests that overwater migration in the Atlantic is much more common in fall (than in spring), when the frequency of overwater flights increases perhaps due to consistent tailwinds (Morris et al. 1994; Hatch et al. 2013; Adams et al. 2015; DeLuca et al. 2015).
Coastal Waterbirds	Coastal waterbirds use terrestrial or coastal wetland habitats and rarely use the marine offshore environment. This group includes aquatic species not captured in other groupings, such as grebes and waterfowl, that are generally restricted to freshwater or use saltmarshes or beaches. Waterfowl comprise a broad group of geese and ducks, most of which spend much of the year in terrestrial or coastal wetland habitats. The diving ducks generally winter on open freshwater, as well as brackish or saltwater. Species that regularly winter on saltwater, including mergansers, scaup, and goldeneyes, usually restrict their distributions to shallow, very nearshore waters. Because most coastal waterbirds spend a majority of the year in freshwater aquatic systems and nearshore marine systems, there is little to no use of the offshore environment around lease areas during any season. A subset of diving ducks has a strong affinity for saltwater, either year-round or outside of the breeding season; these species are known as seaducks.
Marine Birds (by family group)	
Loons	Common loons and red-throated loons are known to use the Atlantic OCS in winter. Analysis of satellite-tracked red-throated loons, captured and tagged in the Mid-Atlantic area, found their winter distributions to be largely inshore of the Mid-Atlantic WEAs, although they did overlap with OCS lease areas during spring migration (Gray et al. 2016).
Seaducks	The seaducks (e.g., black scoter, surf scoter, common eider) use the Atlantic OCS heavily in winter. Most of these seaducks dive to forage on mussels and other benthic invertebrates, and generally winter in shallower inshore waters or out over large offshore shoals, where they can access benthic prey. Seaducks tracked with satellite transmitters remained largely inshore of the lease areas (Spiegel et al. 2017). Based on digital aerial survey data and MDAT models, seaduck exposure is expected to be minimal and would be primarily limited to migration or travel between wintering sites.
Petrel group	In the Atlantic, this group consists mostly of shearwaters (e.g., Cory’s shearwater, great shearwater, sooty shearwater) and storm-petrels (e.g., Wilson’s storm-petrel) that breed in the southern hemisphere and visit the northern hemisphere in vast numbers during the austral winter (boreal summer). These species use the Atlantic OCS region so heavily that, in terms of sheer numbers, they easily outnumber the locally breeding species and year-round residents at this time of year. Several of the species (e.g., Cory’s shearwater, Wilson’s storm-petrel) are found in high densities across the broader region, concentrating beyond the Atlantic OCS and in the Gulf of Maine as shown in the MDAT avian abundance models.
Gannets, Cormorants, and Pelicans	Northern gannets use the Atlantic OCS during winter and migration. They are opportunistic foragers, capable of long-distance oceanic movements. The double-crested cormorant is the most likely species of cormorant in the offshore environment of the lease areas, but regional MDAT abundance models show that cormorants are concentrated closer to shore and not commonly encountered well offshore (Curtice et al. 2016; Winship et al. 2018). Brown pelicans are rare in the area, as only one was detected during surveys performed for adjacent OCS locations, and New Jersey is at the northern extent of its range; therefore, they are unlikely to pass through the NY Bight lease areas in any numbers.
Gulls, skuas, and jaegers	The regional MDAT abundance models show that these birds have wide distributions, ranging from near shore (gulls) to offshore (jaegers). Herring gulls and great black-backed

Bird Group	Potential Bird Presence in the Offshore Project Area
	gulls are resident in the region year-round, and are found farther offshore during the non-breeding season. The parasitic jaeger is often observed closer to shore during migration than the other species and great skuas may migrate along the Atlantic OCS outside the breeding season.
Terns	Black tern, least tern, common tern, Forster's tern, roseate tern, and royal tern have been observed in and around the NY Bight lease areas. Terns generally restrict themselves to coastal waters during breeding, although they may pass through the NY Bight lease areas during migration. Roseate terns are federally listed.
Auks	Auk species present are generally northern or Arctic-breeders that winter along the Atlantic OCS (e.g., common murre, dovekie, razorbill). The annual abundance and distribution of auks along the eastern seaboard in winter is erratic and is dependent upon broad climatic conditions and the availability of prey. The MDAT abundance models show that during winter auks are generally concentrated offshore, along the shelf edge, and southwest of Nova Scotia.

MDAT = Marine-life Data and Analysis Team

Within the Atlantic Flyway, much of the bird activity is concentrated along the coastline (Watts 2010). Waterbirds use a corridor between the coast and several kilometers out onto the OCS, whereas land birds tend to use a wider corridor extending from the coastline to tens of kilometers inland (Watts 2010). Although both groups may occur over land or water within the flyway and may extend considerable distances from shore, the highest diversity and density are centered on the shoreline.

There are four species of birds listed as threatened or endangered under the ESA that may occur in the offshore and onshore project areas: the threatened piping plover (*Charadrius m. melodus*), endangered roseate tern (*Sterna d. dougallii*), threatened Rufa subspecies of the red knot (*Calidris canutus rufa*), and the Eastern rail (*Laterallus jamaicensis jamaicensis*) (addressed as part of the Programmatic Framework ESA Section 7 consultation BOEM initiated with USFWS on June 20, 2024). In terms of ESA-listed bird species by state, four are listed under the ESA in New Jersey and three are listed in New York. Currently, there is no designated critical habitat for any ESA-listed bird species in New Jersey, and critical habitat in New York is designated only for piping plover along the Lake Ontario shoreline, which would be outside of the project area for any of the NY Bight lease areas. In April 2023, USFWS issued a proposed rule (88 *Federal Register* 22530) to designate approximately 680,000 acres as critical habitat for rufa red knot across 13 states, including portions of New York and New Jersey in the geographic analysis area.

Bald eagles (*Haliaeetus leucocephalus*) are federally protected by the Bald and Golden Eagle Protection Act (16 USC 668 et seq.), as are golden eagles (*Aquila chrysaetos*). Golden eagles are found throughout the United States, but mostly in the western half of the United States and are rare in the eastern states (Cornell University 2019). Golden eagles do not fly over the ocean. As with bald eagles, the general morphology of golden eagles dissuades long-distance movements in offshore settings (Kerlinger 1985), as the species generally relies upon thermal formations, which develop poorly over the open ocean, during long-distance movements. As such, golden eagles are unlikely to fly through the NY Bight lease areas.

Bald eagles are broadly distributed across North America and generally nest and perch in areas associated with water (lakes, rivers, bays) in both freshwater and marine habitats, often remaining largely within roughly 1,640 feet (500 meters) of the shoreline (Buehler 2000). Bald eagles are year-round residents in New York and New Jersey and occur in a variety of terrestrial environments, typically near water such as coastlines, rivers, and large lakes (New York Natural Heritage Program 2022; NJDEP n.d.). There are high numbers of observations along the New Jersey and New York coastlines with few bald eagles observed offshore, plus one unusual siting in 2020 of a bald eagle about 40 miles offshore New Jersey (eBird 2024). While it is possible that a bald eagle may be found offshore, the general morphology of bald eagles dissuades long-distance movements in offshore settings, as the species generally relies upon thermal formations, which develop poorly over the open ocean, during long-distance movements. As such, bald eagles are unlikely to fly through the NY Bight lease areas.

3.5.3.2 Impact Level Definitions for Birds

Definitions of potential impact levels are provided in Table 3.5.3-3. Beneficial impacts on birds are described using the definitions provided in Section 3.3.2 (Table 3.3-1).

Table 3.5.3-3. Adverse impact level definitions for birds

Impact Level	Definition
Negligible	There would be no measurable impacts, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Most impacts would be avoided; if impacts occur, the loss of one or a few individuals or temporary alteration of habitat could represent a minor impact, depending on the time of year and number of individuals involved.
Moderate	Impacts would be unavoidable but would not result in population-level effects or threaten overall habitat function.
Major	Impacts would result in severe, long-term habitat or population-level effects on species.

Accidental releases, cable emplacement and maintenance, land disturbance, lighting, noise, presence of structures, and traffic are contributing IPFs to impacts on birds. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.5.3-4.

Table 3.5.3-4. Issues and indicators to assess impacts on birds

Issue	Impact Indicator
Collision/injury/electrocution	Qualitative estimate of species vulnerability to collision/electrocution
Displacement/barrier effects	Changes to noise levels Projected traffic patterns/volume changes
Habitat loss/modification	Acres of habitat removal or modification

3.5.3.3 Impacts of Alternative A – No Action – Birds

When analyzing the impacts of the No Action Alternative on birds, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for birds. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore-wind and offshore wind activities, which are described in Appendix D*, Planned Activities Scenario*.

3.5.3.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, the baseline conditions for birds described in Section 3.5.3.1, *Description of Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends and react to IPFs introduced by other ongoing non-offshore-wind and offshore wind activities. Ongoing non-offshore-wind activities within the geographic analysis area that contribute to impacts on birds are typically associated with onshore construction, coastal lighting, etc. Impacts may also result from activities in the offshore environment (vessel traffic, commercial fisheries, etc.) and climate change. Onshore construction activities and associated impacts are expected to follow current trends and have the potential to affect bird species from temporary and permanent habitat removal or alteration, temporary noise impacts related to construction activities, collisions with proposed structures, and lighting effects, which could cause avoidance behavior and potential displacement as well as injury to or mortality of individual birds. Activities in the offshore environment could result in bird avoidance behavior and displacement; however, local population-level effects are not anticipated for onshore and offshore activities because the level of activity and disturbance is anticipated to remain relatively small compared to total habitat in the geographic analysis area. Impacts of climate change such as increased storm severity and frequency, ocean acidification, altered migration patterns, increased disease frequency, and increased erosion and sediment deposition, have the potential to result in long-term, potentially high-consequence risks to birds and could lead to changes in prey abundance and distribution, changes in nesting and foraging habitat abundance and distribution, and changes to migration patterns and timing.

Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on birds are listed in Table 3.5.3-5. The effects of approved projects have been evaluated through previous NEPA review and are incorporated by reference. Ongoing O&M of the Block Island and Coastal Virginia Offshore Wind Pilot projects and ongoing construction of the Vineyard Wind 1 (OCS-A 0501), South Fork Wind (OCS-A 0517), Ocean Wind 1 (OCS-A 0498), Revolution Wind (OCS-A 0486), Sunrise Wind (OCS-A 0487), New England Wind (OCS-A 0534) Phase 1 and 2, Empire Wind (OCS-A 0512) 1 and 2, and CVOW-Commercial (OCS-A 0483) projects would affect birds through the primary IPFs of accidental releases, lighting, cable emplacement and maintenance, noise, presence of structures, traffic, and land disturbance. Ongoing offshore wind activities would have the same type of impacts from these IPFs that are described in detail in Section 3.5.3.3.3, *Cumulative Impacts of the No Action Alternative,* for ongoing and planned offshore wind activities, but the impacts would be of lower intensity.

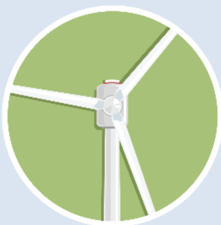
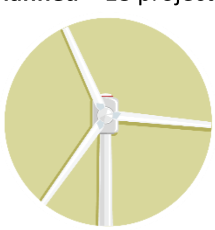
3.5.3.3.2 Impacts of the No Action Alternative on ESA-Listed Species

There are four ESA-listed bird species that may occur within the geographic analysis area; however, the potential occurrence of these listed bird species is expected to be low. The IPFs described in Section 3.5.3.3.3 for all birds would also apply to ESA-listed bird species. Any future federal activities that could affect any listed bird species would need to comply with ESA Section 7 to ensure that the proposed activities do not jeopardize the continued existence of the species. Future non-federal activities would be addressed under ESA Section 10 to ensure that proposed activities do not jeopardize the continued existence of the species.

3.5.3.3.3 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impact of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects). Other planned non-offshore-wind activities that may affect birds include installation of new submarine pipelines, cables, and transmission systems (e.g., PBI), increasing onshore construction, marine mineral extraction, port expansions, and the installation of new structures on the OCS (see Appendix D for a description of planned activities). These activities may result in temporary and permanent impacts on birds including disturbance, potential displacement, injury, mortality, habitat degradation, and habitat alteration. Table 3.5.3-5 lists the ongoing and planned offshore wind activities in the geographic analysis area for birds.

Table 3.5.3-5. Ongoing and planned offshore wind in the geographic analysis area for birds

Ongoing/Planned	Projects by Region
Ongoing – 12 projects[1] 	**MA/RI** • Block Island (state waters) • Vineyard Wind 1 (OCS-A 0501) • South Fork Wind (OCS-A 0517) • Revolution Wind (OCS-A 0486) • Sunrise Wind (OCS-A 0487) • New England Wind (OCS-A 0534) Phase 1 • New England Wind (OCS-A 0534) Phase 2 **NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512) **VA/NC** • CVOW-Pilot (OCS-A 0497) • CVOW-Commercial (OCS-A 0483)
Planned – 18 projects[2] 	**MA/RI** • SouthCoast Wind (OCS-A 0521) • Beacon Wind 1 (OCS-A 0520) • Beacon Wind 2 (OCS-A 0520) • Bay State Wind (OCS-A 0500) • OCS-A 0500 remainder • OCS-A 0487 remainder • Vineyard Wind Northeast (OCS-A 0522) **NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499) **DE/MD** • Skipjack (OCS-A 0519) • US Wind/Maryland Offshore Wind (OCS-A 0490) • GSOE I (OCS-A 0482) • OCS-A 0519 remainder **VA/NC** • Kitty Hawk North (OCS-A 0508)

Ongoing/Planned	Projects by Region
	• Kitty Hawk South (OCS-A 0508) **SC** • Duke Energy Renewables Wind (OCS-A 0546) • Total Energies Renewables (OCS-A 0545)

CVOW = Coastal Virginia Offshore Wind; DE = Delaware; GSOE = Garden State Offshore Energy; MA = Massachusetts; MD = Maryland; NC = North Carolina; NJ = New Jersey; NY = New York; RI = Rhode Island; SC = South Carolina; VA = Virginia

[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.

[2] Status as of September 20, 2024.

BOEM expects other offshore wind development activities to affect birds through the following IPFs.

Accidental releases: The accidental release of fuel/fluids, other contaminants, trash, and debris could occur as a result of offshore wind activities. The assumed risk of any type of accidental release would be increased primarily during construction activities, but also during operations and conceptual decommissioning of offshore wind facilities. Ingestion of hazardous contaminants, such as fuel and fluids from vessels, has the potential to result in lethal and sublethal impacts on birds, including decreased hematological function, dehydration, drowning, hypothermia, starvation, and weight loss (Briggs et al. 1997; Haney et al. 2017; Paruk et al. 2016). Additionally, small exposures to vessel fuel/fluids that result in oiling of feathers can lead to sublethal effects such as changes in flight efficiencies that result in increased energy expenditure during daily and seasonal activities. These daily and seasonal activities include, but are not limited to, chick provisioning, commuting, courtship, foraging, long-distance migration, predator evasion, and territory defense (Maggini et al. 2017). Based on the volumes potentially involved (refer to Appendix D), the likely amount of hazardous contaminant releases associated with offshore wind development would fall within the range of accidental releases that already occur on an ongoing basis from non-offshore-wind activities and would represent a minor impact on birds.

Vessel compliance with USCG regulations would minimize trash or other debris; therefore, BOEM expects accidental trash releases from offshore wind vessels to be rare and localized. In the unlikely event of a release, lethal and sublethal impacts on local bird species could occur resulting in blockages caused by both hard and soft plastic debris (Roman et al. 2019). Given that accidental releases are anticipated to occur primarily during construction activities, BOEM expects that accidental releases of trash and debris would have minor impacts on birds.

Air emissions: The secondary standards of the NAAQS (see Section 3.4.1.1) specifically aim to safeguard the environment, including wildlife and their habitats. Air pollution can directly impact birds via physical harm, such as damage to respiratory systems, or indirectly via changes to habitat conditions, food supplies, and/or species interactions (Lianga et al. 2020). Emissions from fossil fuel combustion include NO_X gases, which interact with ultraviolet radiation in sunlight to form surface-level ozone. A recent study found that air quality improvements limiting ozone over the past 4 decades have stemmed the decline in U.S. bird populations, averting the loss of 1.5 billion birds, particularly among land birds smaller than 142 grams (Liang et al. 2020). By limiting ozone precursor pollutants, such as NO_X, the NAAQS helps prevent harmful effects on vegetation, water bodies, and soil, thus ensuring healthier ecosystems. It is reasonable to assume that the displacement of fossil fuels by the generation of electricity by offshore wind would further reduce ozone and consequently result in minor to moderate beneficial impacts on air quality (see Section 3.4.1). This decrease in NO_X emissions and surface-level ozone formation would consequently have a minor to moderate beneficial impact on populations of small land birds.

Lighting: Offshore wind development would result in additional nighttime light from vessels and offshore wind structures. Construction vessels have an array of lights that could attract some birds and potential prey species to construction zones, potentially exposing them to collision risks with vessels during the construction period. The resulting vessel-related lighting impacts would be localized and minor for bird species.

Up to 2,459 WTGs and 66 OSSs from ongoing and planned offshore wind projects would have navigational and FAA hazard lighting in accordance with BOEM's lighting and marking guidelines. This lighting has some potential to result in long-term impacts and may pose an increased collision or predation risk to migrating birds (Hűppop et al. 2006), particularly to night-flying migrants during low-visibility weather conditions. However, this risk would be minimized through the use of red flashing FAA lighting (Kerlinger et al. 2010). Overall, BOEM anticipates lighting impacts related to offshore wind structures and vessels would be minor.

Cable emplacement and maintenance: Generally, emplacement of submarine cables would result in increased suspended sediments that may affect diving birds, displacement of foraging individuals, or decreased foraging success, and have impacts on some prey species (e.g., benthic assemblages) (Cook and Burton 2010). Impacts associated with cable emplacement would be temporary and localized, and birds would be able to successfully forage in adjacent areas not affected by increased suspended sediments. Any dredging necessary prior to cable installation could also contribute to additional impacts. Disturbed seafloor from construction of offshore wind projects may affect some bird prey species; however, assuming planned projects use installation procedures similar to those proposed in other recent COPs (e.g., Empire Wind OCS-A 0512, Ocean Wind 1 OCS-A 0498), the duration and extent of impacts would be short-term and localized, and benthic assemblages would be expected to recover from disturbance. See Section 3.5.2, *Benthic Resources*, and Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat* for additional information on benthic and fish impacts. Once the cables are installed, limited to no maintenance would be required except if repairs are needed to fix a damaged cable, in which case impacts on birds would be similar to those described for construction but more limited in geographic scope. Impacts would be minor because suspended sediments and potential displacement of foraging birds would be short-term and benthic habitats would recover.

Noise: Anthropogenic noise on the OCS associated with offshore wind development, including noise from aircraft, pile-driving activities, G&G surveys, offshore construction, and vessel traffic, has the potential to result in impacts on birds on the OCS. Additionally, onshore construction noise has the potential to result in impacts on birds. BOEM anticipates that these impacts would be localized and temporary. Potential impacts could be greater if avoidance and displacement of birds occurs during seasonal migration periods. Aircraft flying at low altitudes cause birds to flush, resulting in increased energy expenditure. Disturbance, if any, would be temporary and localized, with impacts dissipating once the aircraft has left the area. No individual or population-level effects would be expected.

Construction of up to 1,682 WTGs and 48 OSSs associated with planned offshore wind projects would create noise and may temporarily affect diving birds. The greatest impact of noise is likely to be created by pile-driving activities during construction. Noise transmitted through water has the potential to result in temporary displacement of diving birds but would be localized to the space around each pile. The impacts from such noise can cause short-term stress and behavioral changes ranging from mild annoyance to escape behavior (BOEM 2014b, 2016). Additionally, localized noise impacts on prey species may affect bird foraging success. Similar to pile-driving, G&G site characterization surveys for offshore wind facilities, which would occur sporadically, would produce high-intensity impulsive noise around sites of investigation, leading to similar impacts.

Onshore noise associated with intermittent construction of required offshore wind development infrastructure may also result in localized and short-term impacts, including avoidance and displacement, though no individual fitness or population-level effects would be anticipated to occur. Noise associated with vessel traffic could disturb some individual diving birds, but they would likely acclimate to the noise or retreat, potentially resulting in a temporary loss of habitat (BOEM 2012). However, brief, temporary responses, if any, would be expected to decrease once the vessel has passed or the individual has moved away. No individual fitness or population-level effects would be anticipated. Overall, noise impacts on birds are anticipated to be minor because noise would primarily occur during construction (i.e., be short term) and localized.

Presence of structures: The presence of structures can lead to long-term effects on birds, both beneficial and adverse, through fish aggregation and associated increase in foraging opportunities, as well as entanglement with lost fishing gear, migration disturbances, and WTG strikes and displacement. These impacts may arise from buoys, meteorological towers, foundations, scour and cable protections, and transmission cable infrastructure. BOEM predicts that structures would be added and that they would remain until conceptual decommissioning of each facility is complete, approximately 35 years following construction.

The primary threat to birds from the presence of structures would be from collision with WTGs. The Atlantic Flyway is an important migratory corridor for as many as 164 species of waterbirds, and a similar number of land birds, with the greatest volume of birds using the Atlantic Flyway during spring and fall migration (Watts 2010). Along the Atlantic Flyway, much of the bird activity is concentrated along the coastline (Watts 2010). Waterbirds use a corridor between the coast and several kilometers out onto the OCS, while land birds tend to use a wider corridor extending from the coastline to tens of kilometers inland (Watts 2010). While both groups may occur over land or water within the flyway and may extend considerable distances from shore, the highest diversity and density are centered on the shoreline. Building on this information, Robinson Willmott et al. (2013) evaluated the sensitivity of bird resources to collision and displacement due to offshore wind development on the Atlantic OCS and included the 164 species selected by Watts (2010) plus an additional 13 species, for a total of 177 species that may occur on the Atlantic OCS from Maine to Florida during all or some portion of the year.

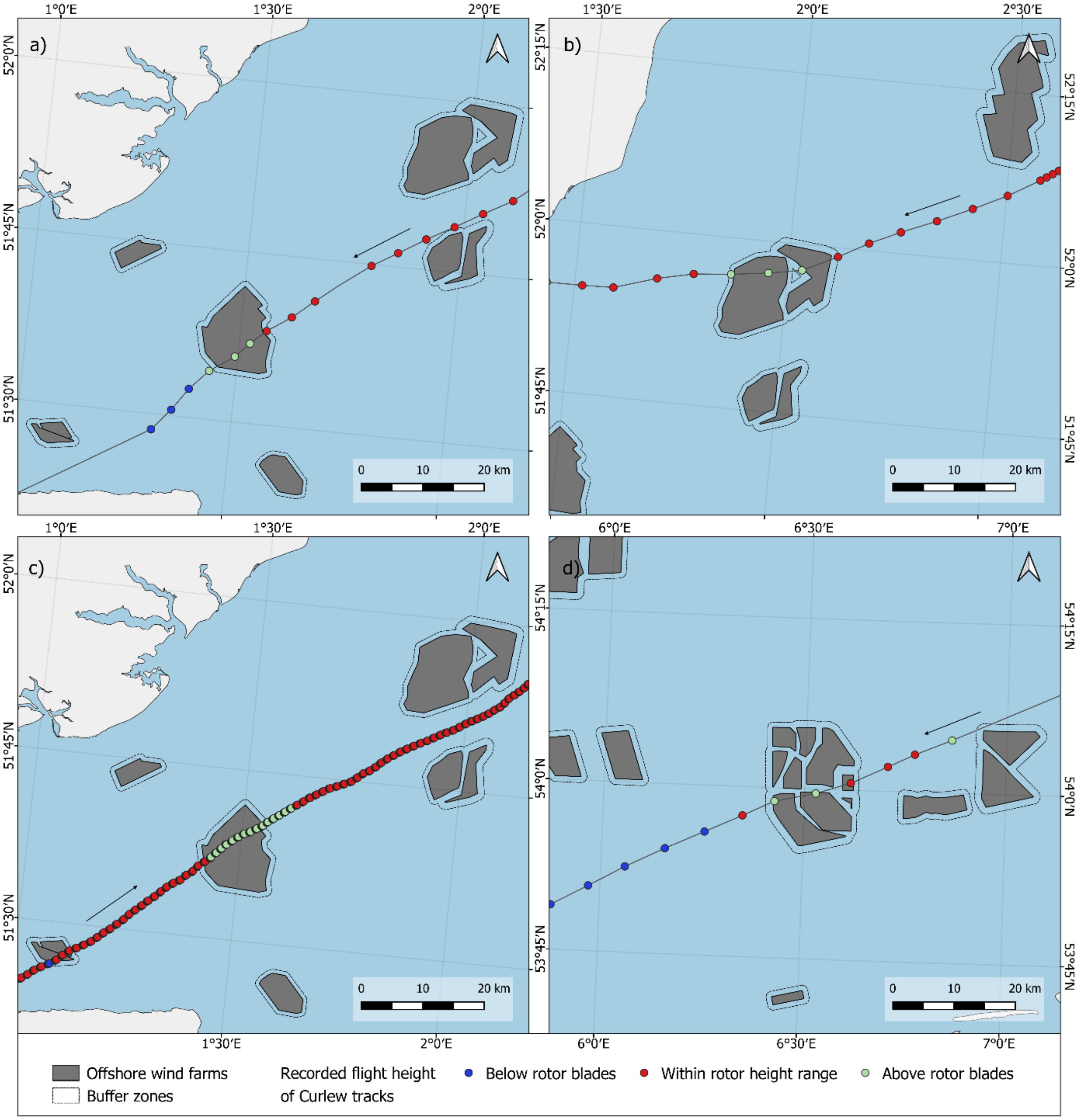
As discussed in Robinson Willmott et al. (2013) and consistent with Garthe and Hüppop (2004), Furness and Wade (2012), and Furness et al. (2013), species with high scores for sensitivity for collision include gulls, jaegers, and the northern gannet (*Morus bassanus*). A collision sensitivity ranking of migratory birds near the Nysted wind farm in Denmark by Desholm (2009) also found that waterbirds and birds of prey had higher collision sensitivity scores and passerines had lower collision sensitivity scores. In many cases, high collision sensitivity is driven by high occurrence on the OCS, low avoidance rates with high uncertainty, and time spent in the RSZ. Many of the species addressed in Robinson Willmott et al. (2013) have low collision sensitivity, including passerines that spend very little time on the Atlantic OCS during migration and typically fly above the RSZ. Robinson Willmott et al. (2013) stated that because of identified data gaps and related uncertainty, particularly concerning species-specific flight altitude and avoidance behavior, their results should be interpreted with caution. As discussed by Watts (2010), 55 seabird species could encounter operating WTGs on the Atlantic OCS. However, generally the abundance of bird species that overlap with the anticipated development of wind energy facilities on the Atlantic OCS is relatively small (Figure 3.5.3-2). Of the 55 bird species, 49 have sufficient survey data to calculate the modeled percentage of a species population that would overlap with the anticipated offshore wind development on the Atlantic OCS (Winship et al. 2023); the relative annual exposure of these species is generally very low, ranging from 0.00 to 4.10 percent (Table 3.5.3-1). The estimated percentage of federally listed species and Birds of Conservation Concern populations that overlap offshore wind development areas ranges from only 0.00 to 1.00 percent (Table 3.5.3-1). BOEM assumes that the 49 species (89 percent) with sufficient data to model the relative distribution and abundance on the Atlantic OCS are representative of the 55 species that may overlap with offshore wind development on the Atlantic OCS.

Ongoing and planned offshore wind development would result in up to 2,459 WTGs in the bird geographic analysis area (Appendix D, Tables D.A2-1 and D.A2-2). In the contiguous United States, bird collisions with operating onshore WTGs are relatively rare events. Loss et al. (2013) estimated 140,000 to 328,000 (mean = 234,000) birds killed annually from 44,577 onshore monopile wind turbines across the contiguous United States. Bird collisions with onshore monopile turbines in the eastern United States is estimated at 6.86 birds per turbine per year (Loss et al. 2013). Based on this mortality rate, an estimated 16,869 birds could be killed annually from the 2,459 WTGs that would be added for offshore wind development. This represents a maximum-case scenario and does not consider mitigating factors, such as landscape and weather patterns, or bird species that are expected to occur. Given that the relative density of birds in the OCS is low, relatively few birds are likely to encounter offshore WTGs (see Figure 3.5.3-2). Potential annual bird kills from offshore WTGs would be relatively low compared to other causes of migratory bird deaths in the United States; feral cats are the primary cause of migratory bird deaths in the United States (2.4 billion per year), followed by collisions with building glass (599 million per year), collisions with vehicles (214.5 million per year), poison (72 million per year), collisions with electrical lines (25.5 million per year), collisions with communication towers (6.6 million per year), and electrocutions (5.6 million per year) (USFWS 2021a).

Not all individuals that occur or migrate along the Atlantic Coast are expected to encounter the RSZ of one or more operating WTGs associated with planned offshore wind development. Generally, only a small percentage of a species' seasonal population would potentially encounter operating WTGs (Table 3.5.3-1). The addition of WTGs to the offshore environment may result in increased functional loss of habitat for those species with higher displacement sensitivity. However, a recent study of long-term data collected in the North Sea found that despite the extensive observed displacement of loons in response to the development of 20 wind farms, there was no decline in the region's loon population (Vilela et al. 2021). Furthermore, substantial foraging habitat for resident birds would remain available outside of the proposed offshore lease areas, and no individual fitness or population-level impacts would be expected to occur.

Vattenfall (a European energy company) recently studied bird movements within an offshore wind farm situated 1.9–3 miles (3–4.9 kilometers) off the coast of Aberdeen, Scotland (Vattenfall 2023). The purpose of the study was to improve the understanding of seabird flight behavior inside an offshore wind farm with a focus on the bird breeding period and post-breeding period when densities are highest. The study was robust in that seabirds were tracked inside the array with video cameras and radar tracks, which allowed for measuring avoidance movements (meso- and micro-avoidance)[1] with high confidence and at the species level. Detailed statistical analyses of the seabird flight data were enabled both by the large sample sizes and by the high temporal resolution in the combined radar track and video camera data. Meso-avoidance behavior showed that species avoided the RSZ by flying in between the turbines with very few avoiding by changing their flight altitude in order to fly either below or above the rotors. The most frequently recorded adjustment under micro-avoidance behavior was birds flying along the plane of the rotor; other adjustments included crossing the rotor either obliquely or perpendicularly, and some birds cross the rotor-swept area without making any adjustments to the spinning rotors. The study concluded that, together with the recorded high levels of micro-avoidance in all species (>0.96), it is now evident that seabirds will be exposed to very low risks of collision in offshore wind farms during daylight hours. This was substantiated by the fact that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the 2 years of monitoring covering the April–October period. The study's calculated micro-avoidance rate (above 0.96) is similar to Skov et al. (2018). Further evidence supporting turbine avoidance can be found in Schwemmer et al. (2023), in which 70 percent of approaching 143 Global Positioning System (GPS) tracked Eurasian curlews (*Numenius arquata arquata*) demonstrated horizontal avoidance responses when approaching offshore wind farms in the Baltic and North Seas. While most curlews avoided entire wind farms, others changed their flight altitude to fly below or above the RSZ as they pass through the wind farm (Figure 3.5.3-3, Figure 3.5.3-4, and Figure 3.5.3-5). Given that curlews and red knots are in the same family (Scolopacidae) and are ecologically similar, it is reasonable to expect that red knots would behave similarly to curlews when encountering wind farms and turbines.

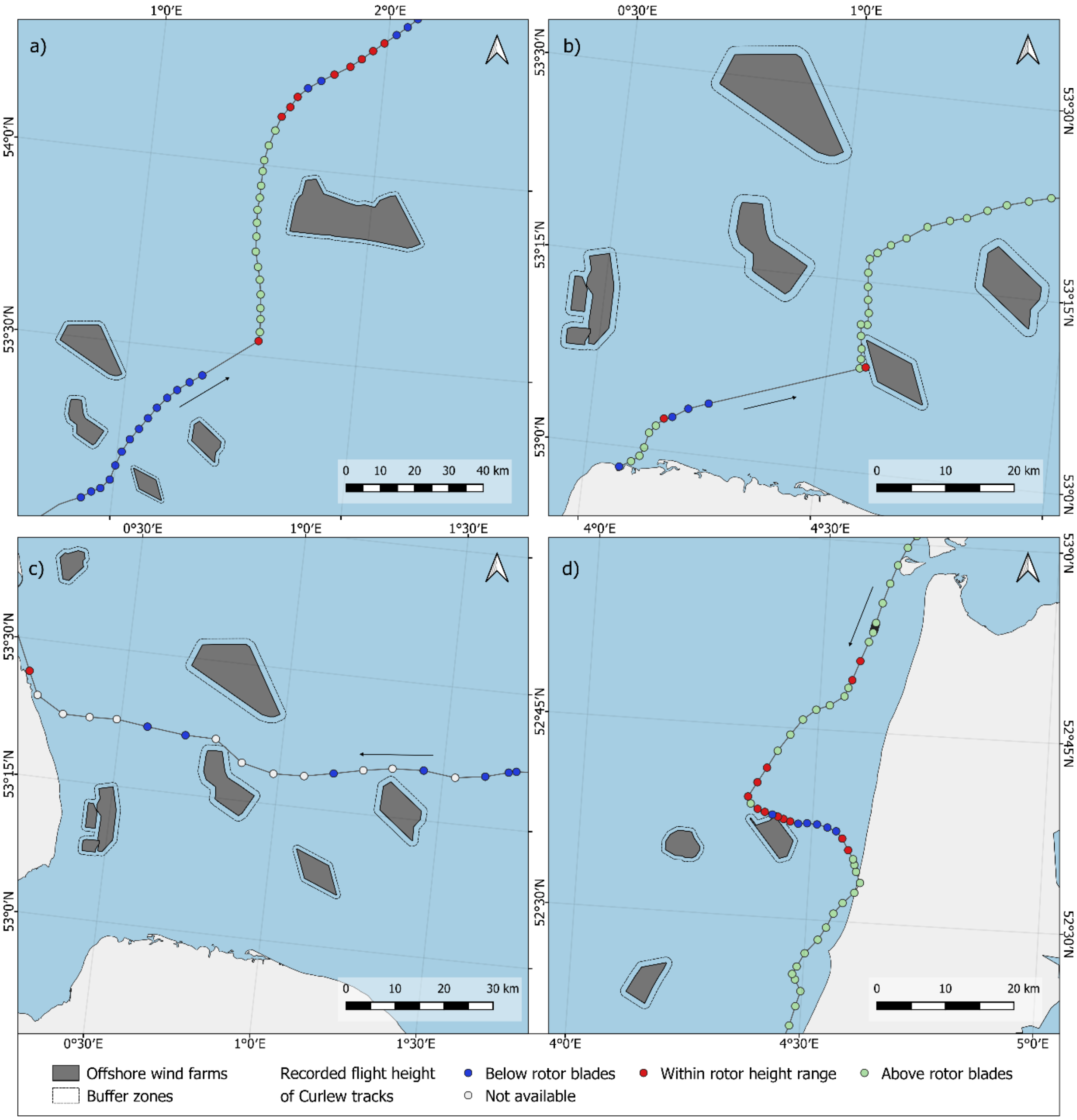
[1] Micro-avoidance is flight behavior within and in the immediate vicinity of individual wind turbine rotor-swept areas (i.e., last second action to avoid collision); meso-avoidance is flight behavior within and in the immediate vicinity of the wind farm (i.e., anticipatory/impulsive evasion of rows of turbines in a wind farm).



Source: Figure S2 in Schwemmer et al. (2023).

Note: a) “London Array” (UK; rotor level: 27–147 meters); b) “Galloper” and “Greater Gabbard” (UK; mean rotor level: 26.1–145.9 meters); c) “London Array” (UK; rotor level 27–147 meters); d) “Alpha Ventus,” “Borkum Riffgrund 1,” “Borkum Riffgrund 2” “Merkur,” “Triane Windpark,” “Borkum I,” and “Trianel Windpark Borkum II” (Germany; mean rotor level: 27.3– 166.2 meters). Different colors of GPS fixes represent different flight altitudes.

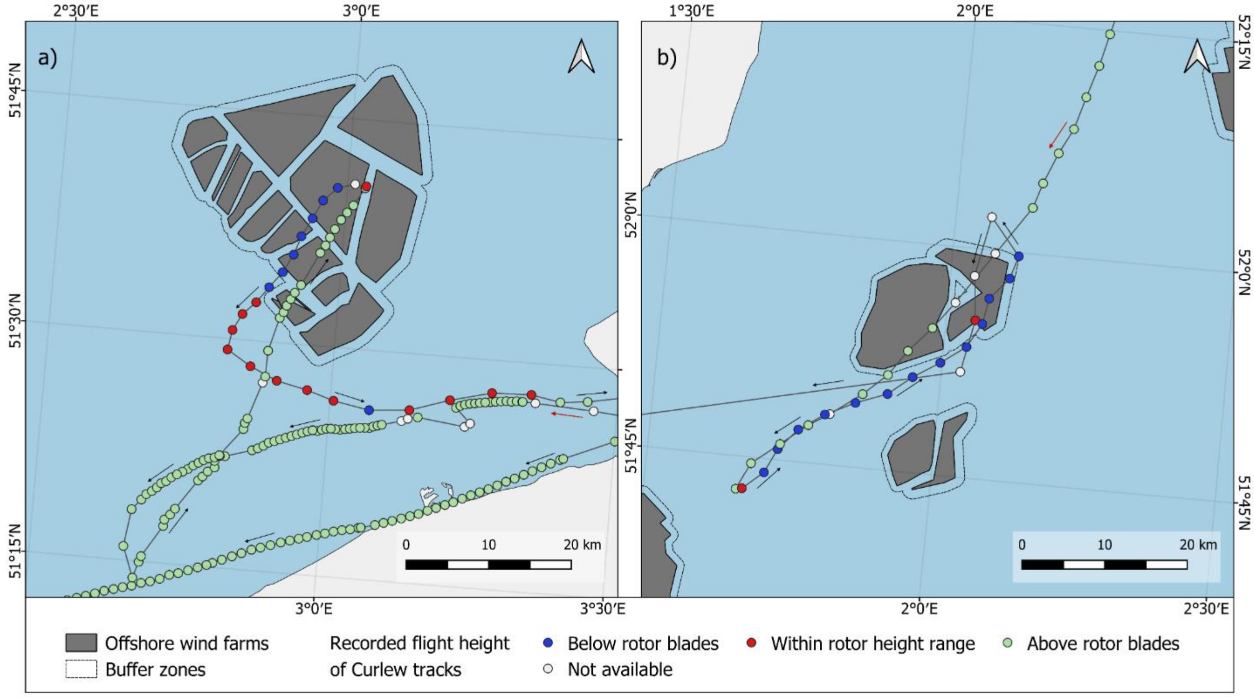
Figure 3.5.3-3. Four examples of curlews approaching offshore wind farms that show avoidance in the vertical plane by increasing flight altitudes



Source: Figure S3 in Schwemmer et al. (2023).

Note: a) "Hornsea Project One" (United Kingdom; rotor level: 36–190 meters); b) "Sheringham Shoal" (United Kingdom; rotor level: 26.5–133.5 meters); c) "Race Bank" (United Kingdom; rotor level 23–177 meters); d) "Egmond aan Zee" (The Netherlands; rotor level: 25–115 meters). Different colors of GPS fixes represent different flight altitudes.

Figure 3.5.3-4. Four examples of curlews approaching offshore wind farms that show avoidance in the horizontal plane by changing flight directions



Source: Figure S4 in Schwemmer et al. (2023).
Note: Left panel: offshore wind farm cluster belonging to Belgium and The Netherlands. The bird entered the North Sea approaching from The Netherlands, performed a loop in the south, entered the cluster and returned to a roost in The Netherlands where it stayed for 9 days before continuing its journey in a straight track. Right panel: "Galloper" and "Greater Gabbard" belonging to the United Kingdom. The bird entered from the north, crossed the cluster, performed a circle in the south, entered the cluster again, performed another circle in the north, entered the cluster for a third time, and left the area towards the southwest. Arrows depict flight directions.

Figure 3.5.3-5. Non-directional flights within or in the vicinity of two offshore wind farm clusters made by two curlews tagged as breeding in north Germany

Because most offshore structures would likely be spaced 0.6 to 1 nm (1.1 to 1.9 kilometers) apart, sufficient space between WTGs should allow birds that are not flying above WTGs to fly through individual lease areas without changing course or to make minor course corrections to avoid the WTGs in operation. The effects of offshore wind farms on bird movement ultimately depends on the bird species, size of the offshore wind farm, spacing of turbines, and extent of extra energy costs incurred by the displacement of flying birds (relative to normal flight costs pre-construction) and their ability to compensate for this degree of added energy expenditure. Little quantitative information is available on how offshore wind farms may act as a barrier to movement, but Madsen et al. (2012) modeled bird movement through offshore wind farms using bird (common eider) movement data collected at the Nysted offshore wind farm in the western Baltic Sea just south of Denmark. After running several hundred thousand simulations for different layouts/configurations for a 100 WTG offshore wind farm, the proportion of birds traveling between the turbines increased as distance between turbines increased. With eight WTG columns at 200 meters (0.1 nm) spacing, no birds passed between the turbines. However, increasing inter-turbine distance to 500 meters (0.27 nm) increased the percentage of birds to more than 20 percent, while a spacing of 1,000 meters (0.54 nm) increased this further to 99 percent. The 0.6 to 1 nm spacing estimated for most structures that will be proposed on the Atlantic OCS is greater than the distance at which 99 percent of the birds passed through in the model. As such, adverse impacts of additional energy expenditure due to minor course corrections or complete avoidance of the lease areas would not be expected to be biologically significant. Any additional flight distances would likely be small for most migrating birds when compared with the overall migratory distances traveled, and no individual fitness or population-level effects would be expected to occur. Similar results were also reported for foraging birds. A recent study based on GPS tracking of sandwich terns (*Thalasseus sandvicensis)* near several European wind farms found that avoidance rates of offshore wind turbines increased with turbine density (van Bemmelen et al. 2023); interestingly, the turbines in those wind farms were much closer to each other than anticipated in the NY Bight, suggesting the proposed turbine spacing may not create a barrier that would displace foraging sandwich terns or other tern species.

The addition of WTGs to the offshore environment may result in increased functional loss of habitat for those species with higher displacement sensitivity. Displacement and avoidance can cause birds to expend more energy and to forage in other areas. However, overall habitat loss due to displacement is unlikely to affect population trends because of the relatively small size of wind farm project areas in relation to the available foraging habitat (Fox and Petersen 2019). A recent study of long-term data collected in the North Sea found that despite the substantial observed displacement of loons in response to the development of 20 wind farms, there was no decline in the region's local loon population (Vilela et al. 2021). Extensive foraging habitat for resident birds would remain available outside of the offshore lease areas; therefore, the impacts on birds due to the presence of operating WTGs would likely be low.

In the Northeast and Mid-Atlantic waters, there are 2,570 seabird fatalities through interaction with commercial fishing gear each year; of those, 84 percent are with gillnets involving shearwaters/fulmars and loons (Hatch 2017). Abandoned or lost fishing nets from commercial fishing may get tangled with foundations, reducing the chance that abandoned gear would cause additional harm to birds and other wildlife if left to drift until sinking or washing ashore. A reduction in derelict fishing gear (in this case by entanglement with foundations) has a beneficial impact on bird populations (Regular et al. 2013). In contrast, the presence of structures may also increase recreational fishing and, thus, expose individual birds to harm from fishing line and hooks.

The presence of new structures could result in increased prey items for some local marine bird species. Offshore wind foundations could increase the mixing of surface waters and deepen the regional thermocline, resulting in the potential increase in pelagic productivity in local areas (English et al. 2017). Additionally, new structure installation may create habitat for structure-oriented or hard-bottom species, typically referred to as "reef effect." This reef effect has been observed around WTGs, which can result in local increases in biomass and diversity (Causon and Gill 2018). Recent studies have revealed increased biomass for benthic fish and invertebrates, and potentially for pelagic fish, marine mammals, and birds (Raoux et al. 2017; Pezy et al. 2018; Wang et al. 2019), indicating that the installation of offshore wind energy facilities can generate beneficial permanent impacts on local ecosystems, resulting in increased foraging opportunities for individuals of local marine bird species. BOEM anticipates that the presence of structures may result in permanent beneficial impacts. Conversely, increased foraging opportunities could attract marine birds, potentially exposing those individuals to increased collision risk associated with operating WTGs.

Overall, the abundance of bird species that overlap with ongoing wind energy facilities on the Atlantic OCS is relatively small, and the presence of structures is anticipated to have minor impacts on birds.

Traffic (aircraft): General aviation traffic is responsible for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2019). Because aircraft flights associated with offshore wind development are anticipated to be minimal, aircraft strikes with birds are highly unlikely to occur. As such, aircraft traffic impacts would be negligible and would not be expected to appreciably contribute to overall impacts on birds.

Land disturbance: Onshore construction of offshore wind and transmission infrastructure has the potential to result in some impacts due to habitat loss or fragmentation. While transmission infrastructure, such as PBI, would likely be primarily co-located with existing roads and rights-of way, habitat alteration from planned non-offshore wind activities may occur. Habitat and/or species surveys may be conducted in accordance with federal and state requirements to support federal and state agency consultation and permitting requirements, and consultation and permitting may require that construction activities be seasonally restricted to occur when impacts to birds can be avoided or minimized. However, onshore construction would be expected to account for only a very small increase in development relative to other ongoing development activities. Further, construction would be expected to generally occur in previously disturbed habitats, and no individual fitness or population-level impacts on birds would be expected to occur. As such, onshore construction associated with planned offshore wind development would be minor and would not be expected to appreciably contribute to overall impacts on birds.

3.5.3.3.4 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, birds would continue to be affected by existing environmental trends and ongoing activities. BOEM anticipates ongoing activities to have continuing temporary and permanent impacts (disturbance, displacement, injury, mortality, habitat degradation, habitat alteration) on birds primarily through construction activities and climate change. Given that the abundance of bird species that overlap with ongoing wind energy facilities on the Atlantic OCS is relatively small, ongoing wind activities would not significantly contribute to impacts on birds. Temporary disturbance and permanent loss of onshore habitat may occur as a result of offshore wind development. However, habitat removal is expected to be minimal, and any impacts resulting from habitat loss or disturbance would not be anticipated to result in individual fitness or population-level effects within the geographic analysis area. The No Action Alternative would likely result in **negligible** to **minor** impacts on birds.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and birds would continue to be affected by natural and anthropogenic IPFs. Additionally, planned activities would contribute to the impacts on birds due to habitat loss from increased onshore construction and interactions with offshore developments. BOEM anticipates that the impacts associated with offshore wind activities in the geographic analysis area would result in adverse impacts but could potentially include beneficial impacts because of the presence of structures and reduction in ozone levels from fossil fuel displacement. The majority of offshore structures in the geographic analysis area would be attributable to offshore wind development. Migratory birds that use the offshore wind lease areas during all or parts of the year would either be exposed to new collision risk or experience long-term functional habitat loss due to behavioral avoidance and displacement from wind lease areas on the OCS. The offshore wind development would also be responsible for the majority of impacts related to new cable emplacement and pile-driving noise, but effects on birds resulting from these IPFs would be localized and temporary and would not be expected to be biologically significant. BOEM anticipates that the cumulative impacts of the No Action Alternative would likely have a **negligible** to **moderate** impact on birds but could also include moderate beneficial impacts because of the presence of offshore structures. In addition, the displacement of fossil fuels in the generation of electricity by offshore wind would further reduce ozone and consequently result in minor to moderate beneficial impacts to populations of small land birds. The overall beneficial impact on birds due to presence of offshore structures and displacement of fossil fuels would be **minor beneficial** to **moderate beneficial**.

3.5.3.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Birds

3.5.3.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Accidental releases: Because a NY Bight project would be required to comply with federal and state requirements related to the prevention and control of accidental releases, the expected impacts of accidental releases associated with one NY Bight project would be negligible and would not increase impacts beyond those described for the No Action Alternative.

Air emissions: Similar to the No Action Alternative, the displacement of fossil fuels in the generation of electricity by offshore wind would contribute toward limiting ozone precursor pollutants (such as NO_X), which would result in healthier ecosystems. This decrease in NO_X emissions and surface-level ozone formation would consequently have a minor to moderate beneficial impact on populations of small land birds.

Lighting: Nighttime lighting associated with up to 280 WTGs, 5 OSSs, and multiple vessels (during construction, operations, and conceptual decommissioning) could represent a source of bird attraction, with the same types of impacts on birds described for the No Action Alternative. Similar to the No Action Alternative, vessel-related lighting impacts during construction and operation would be localized and a low risk for bird species. For offshore structure lighting, in the absence of light reduction measures (e.g., aircraft detection lighting system [ADLS]), potential offshore structure lighting impacts during operations could result in moderate impacts on birds.

Cable emplacement and maintenance: Installation of 1,479 miles (2,380 kilometers) of interarray and export cables from a single NY Bight project would result in increased suspended sediments and disturbed seafloor that may affect diving birds, displacement of foraging individuals, or decreased foraging success, and have impacts on some benthic prey species. However, assuming cable installation and maintenance in the NY Bight lease areas would be similar to the installation methods and maintenance activities employed at adjacent wind projects (e.g., Empire Wind OCS-A 0512, Ocean Wind 1 OCS-A 0498), impacts from suspended sediments would be short term and localized, and birds would be able to successfully forage in adjacent areas not affected by increased suspended sediment. In addition, due to the short term and localized nature of the suspended sediment impact, benthic assemblages would be expected to recover from seafloor disturbance. Therefore, impacts from cable emplacement and maintenance are anticipated to be minor.

Noise: Pile-driving noise from up to 280 WTGs, as well as onshore and offshore construction noise, associated with one NY Bight project is anticipated to result in temporary and highly localized impacts. Dredging vessels and other construction noise could temporarily disturb and displace some bird species, but they are likely already acclimated to noise in an urban environment and would be able to easily avoid the noise impacted areas. Under a single NY Bight project, BOEM anticipates noise impacts on birds to be minor and limited to behavioral avoidance of pile-driving or construction activity.

Presence of structures: The numerous types of impacts on birds that could result from the presence of structures, such as migration disturbance, habitat loss/fragmentation, and turbine strikes, are described in detail in Section 3.5.3.3.3. Between 50–280 WTGs and 1–5 OSSs on the OCS would result from a single NY Bight project where few currently exist. The structures, and related bird impacts, associated with one NY Bight project would remain at least until conceptual decommissioning is complete and could pose long-term effects on birds, both disadvantageous and beneficial.

There are few resources that show the level of bird use of the OCS and the ultimate consequences of mortality, if any, associated with operating WTGs. Migratory birds have the potential to pass through the NY Bight lease areas, but overall, a small number is expected within the lease areas given their distance from shore.

As depicted for the offshore wind lease areas on Figure 3.5.3-2, avoiding areas with high concentrations of birds was a factor in selecting locations for offshore wind lease areas on the OCS. All six NY Bight lease areas are located at least 20 nautical miles (37 kilometers) offshore. Within the Atlantic Flyway along the North American Atlantic Coast, much of the bird activity is concentrated along the coastline (Watts 2010). Waterbirds use a corridor between the coast and several kilometers out onto the OCS, while land birds tend to use a wider corridor extending from the coastline to tens of kilometers inland (Watts 2010). However, operation of WTGs in the NY Bight lease areas could result in impacts on some individuals of offshore bird species and possibly some individuals of coastal and inland bird species during spring and fall migration. These impacts could arise through direct mortality from collisions with WTGs or through behavioral avoidance and habitat loss (Drewitt and Langston 2006; Fox et al. 2006; Goodale and Millman 2016). The predicted activity of bird populations that have a higher sensitivity to collision (as defined by Robinson Willmott et al. [2013]) is relatively low in the OCS during all seasons of the year (Figure 3.5.3-6), suggesting that bird fatalities due to collision are likely to be low. Similarly, the predicted activity of bird populations that have a higher sensitivity to displacement is relatively low in the OCS (Figure 3.5.3-7).

When WTGs are present, many birds would avoid the WTG site altogether, especially the species that ranked “high” in vulnerability to displacement by offshore wind energy development (Robinson Willmott et al. 2013). In addition, many birds would likely adjust their flight paths to avoid WTGs by flying above, below, or between them (e.g., Desholm and Kahlert 2005; Plonczkier and Simms 2012; Skov et al. 2018), and others may take extra precautions to avoid WTGs when the WTGs are moving (Johnston et al. 2014). Several species have very high avoidance rates; for example, the northern gannet, black-legged kittiwake, herring gull, and great black-backed gull have measured avoidance rates of at least 99.6 percent (Skov et al. 2018). As mentioned in Section 3.5.3.3.3, Vattenfall (a European energy company) recently studied bird movements within an offshore wind farm situated 1.9 to 3 miles (3 to 4.9 kilometers) off the coast of Aberdeen, Scotland (Vattenfall 2023). The study’s calculated micro-avoidance rate (>0.96) is similar to Skov et al. (2018). Further evidence supporting turbine avoidance can be found in Schwemmer et al. (2023), in which 70 percent of approaching Eurasian curlews (*Numenius arquata arquata*) demonstrated horizontal avoidance responses when approaching offshore wind farms in the Baltic and North Seas.

Avian collision risk impact assessments have been performed for adjacent OCS lease areas (e.g., Empire Wind OCS-A 0512 and Ocean Wind 1 OCS-A 0498) and provide some insight into the potential collisions risk for the NY Bight lease areas. The majority of the bird species identified in the impact assessment for Empire Wind are expected to have “minimal” to “low” overall exposure risk. Similar to Empire Wind, the avian impact assessment performed for Ocean Wind 1 determined the overall exposure risk to be “minimal” to “low.” Further, coastal birds are considered to have minimal exposure (occurrence) within the NY Bight lease areas because they are far enough offshore to be beyond the range of most breeding terrestrial or coastal bird species. Falcons may be potentially exposed to the NY Bight lease areas during migration; however, the proportion of migrating falcons that may be attracted to offshore wind energy projects for perching, roosting, and foraging is uncertain, as is the extent to which individuals might avoid WTGs or collide with them.

Overall, because the presence of birds in the offshore environment is generally low, and avian risk analyses conducted by nearby lease areas indicate low risk, BOEM anticipates the presence of structures from one project in the NY Bight lease areas would have a minor impact on birds.

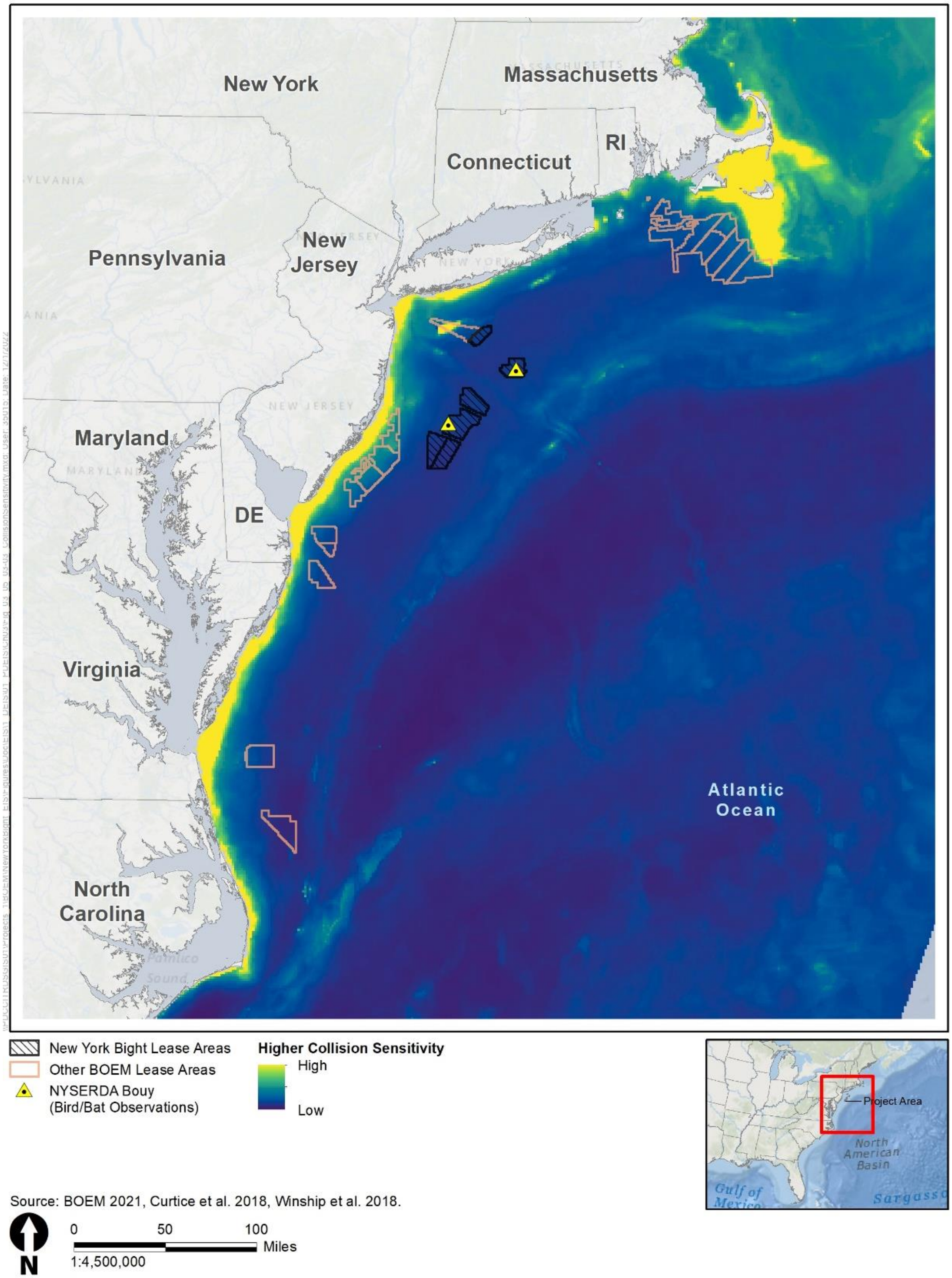


Figure 3.5.3-6.Total avian relative abundance distribution map for the higher collision sensitivity species group

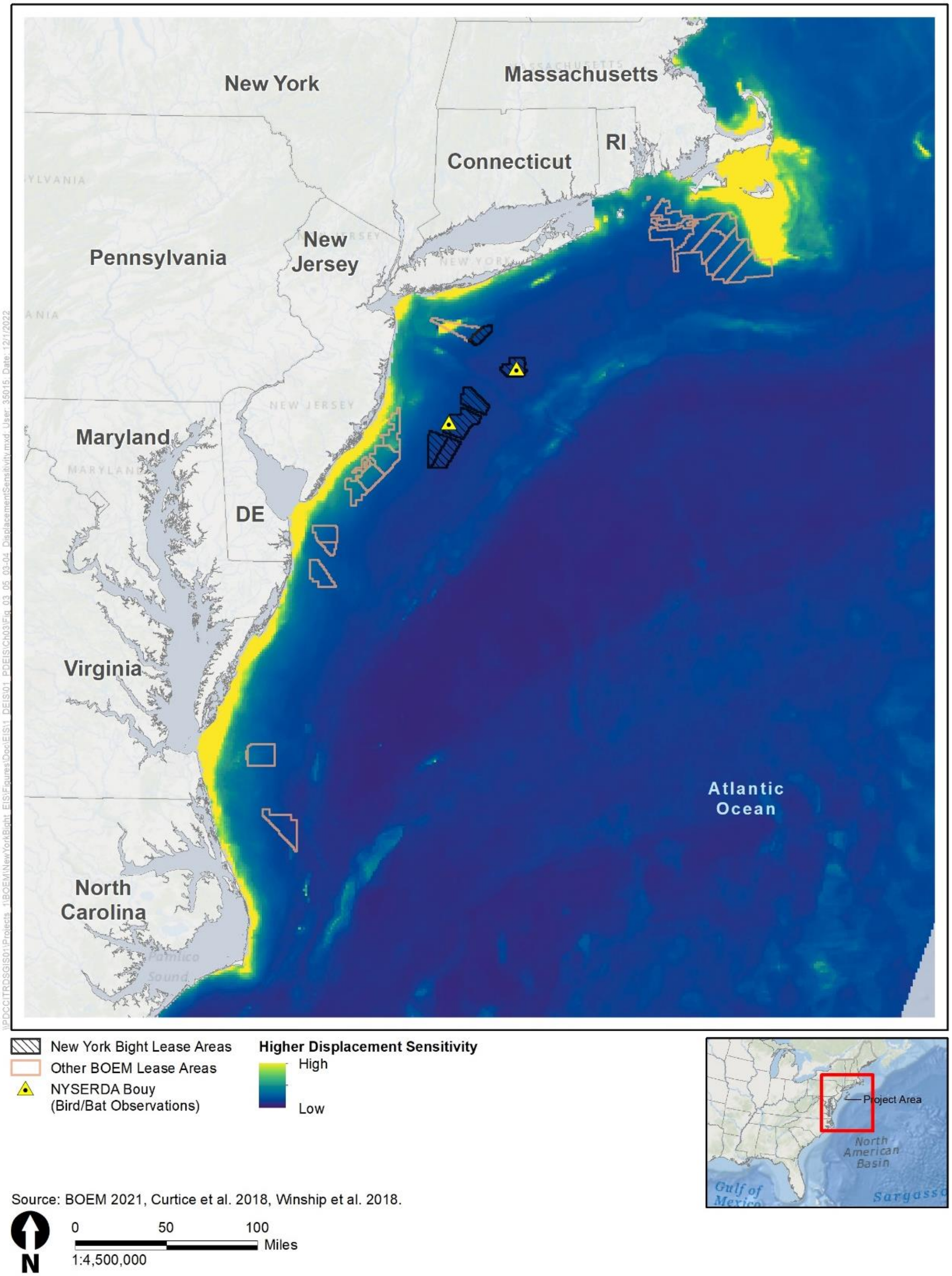


Figure 3.5.3-7. Total avian relative abundance distribution map for the higher displacement sensitivity species group

Traffic (Aircraft): The expected impacts of aircraft traffic associated with a single NY Bight project would not increase beyond the negligible impacts described for the No Action Alternative.

Land disturbance: Impacts associated with construction of onshore elements of one NY Bight project are anticipated to be localized and short term. There would be some potential for habitat impacts on birds as a result of the loss of potentially suitable nesting or foraging habitat. However, BOEM anticipates that impacts on bird habitat from onshore construction activities would be limited because, based on other recent offshore wind projects, whenever possible, facilities (including overhead transmission lines) would be co-located with existing developed areas (i.e., roads and existing transmission lines) to limit disturbance. Any habitat that may be present within permanent substation sites or other permanent facilities would be converted to developed land with landscaping for the duration of the NY Bight project's operational lifetime, which would be considered a long-term effect. While BOEM anticipates habitat clearing to be minimal due to the likely placement of onshore project components in previously disturbed areas, it is possible that larger areas of habitat could be temporarily and permanently cleared. Disturbance to the land surface or terrestrial habitat during the course of conceptual decommissioning would be minimal if onshore components are left in place and abandoned or if minimal disturbance would be required for conceptual decommissioning, such as disconnecting and cutting buried cables at the fence site below ground. If conceptual decommissioning required complete removal of onshore cable, the impacts would be similar to installation impacts. Overall, BOEM anticipates habitat loss would be limited and minor, and any potential effects would be indirect and unlikely to affect individual or population levels of bird species. However, the area of suitable bird habitat removed could vary, depending on the specific siting of the onshore project components, and could result in moderate impacts.

3.5.3.4.2 Impacts of Six Projects

There would be greater potential for impacts under six NY Bight projects due to the greater amount of offshore and onshore development as compared to a single NY Bight project. However, noise impacts are still anticipated to be minimal because noise has limited effects on local birds (see *Impacts of One Project*). The intensity of the impacts from the IPFs related to the offshore environment from a greater number of offshore structures and cables is unlikely to substantially change because bird presence on the OCS is generally low. Therefore, impacts on birds in the offshore environment under six NY Bight projects are anticipated to be negligible to moderate.

The same land disturbance IPF impact types and mechanisms described under one NY Bight project apply to six NY Bight projects. Similar to a single NY Bight project, the level of impact on birds from land disturbance depends on the amount of habitat affected from the onshore project components. While BOEM anticipates that impacts on bird habitat from onshore construction activities under six NY Bight projects would be limited, it is possible that larger areas of habitat could be temporarily and permanently cleared. Under six NY Bight projects, the potential for this possibility would be greater compared to one NY Bight project due to the increased amount of offshore wind development that would occur but would still likely result in a potential negligible to moderate range of impacts.

3.5.3.4.3 Impacts of Alternative B on ESA-Listed Species

The presence of federally protected bird species in the offshore environment would generally be limited. On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation.

3.5.3.4.4 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of both onshore and offshore infrastructure for offshore wind activities across the geographic analysis area would also contribute to the primary IPFs of accidental releases, air emissions, lighting, cable emplacement and maintenance, noise, presence of structures, traffic (aircraft), and land disturbance. Given that the abundance of bird species that overlap with wind energy facilities on the Atlantic OCS is relatively small, offshore wind activities would not appreciably contribute to impacts on bird populations. Temporary disturbance and permanent loss of habitat onshore may occur as a result of offshore wind development. However, habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the geographic analysis area.

The cumulative impacts on birds would likely be moderate because, although bird abundance on the OCS is low, there could be unavoidable impacts offshore and onshore; however, BOEM does not anticipate the impacts to result in population-level effects or threaten overall habitat function. This conclusion would not change even if the six NY Bight projects are constructed at the same time or staggered. In context of reasonably foreseeable environmental trends, the impact of Alternative B to the cumulative accidental releases, air emissions, lighting, cable emplacement and maintenance, presence of structures, traffic (aircraft), and land disturbance impacts on birds would be undetectable.

3.5.3.4.5 Conclusions

Impacts of Alternative B. In summary, construction, installation, and conceptual decommissioning of Alternative B, whether one NY Bight project or six NY Bight projects, would likely have **negligible** to **moderate** impacts on birds, depending on the offshore lighting scheme, amount and quality of habitat removed and the duration of construction activities, as well as the timing and species affected by an activity. The main significant risk would be from operation of the offshore WTGs (including lighting) and potential onshore removal of habitat, which could lead to long-term impacts in the form of mortality, although BOEM anticipates this to be rare. Alternative B would likely also potentially result in **minor beneficial** impacts associated with offshore foraging opportunities for some marine birds, and **minor** to **moderate beneficial** impacts on populations of small land birds due to the reduction in ozone from displacement of fossil fuels in the generation of electricity by offshore wind.

Cumulative Impacts of Alternative B. BOEM anticipates that the cumulative impacts on birds in the geographic analysis area would likely be **negligible** to **moderate** and **minor** to **moderate beneficial** under six NY Bight projects. In context of other reasonably foreseeable environmental trends, the impacts contributed by Alternative B to the cumulative impacts on birds would be undetectable.

Alternative B would contribute to the cumulative impacts primarily through the permanent impacts from the presence of structures and long-term impacts from habitat loss from onshore project components.

3.5.3.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Birds

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.5.3.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations (Table 3.5.3-6).

Table 3.5.3-6. Summary of previously applied avoidance, minimization, mitigation, and monitoring measures for birds

Measure ID	Measure Summary
BB-1	This measure proposes requiring that any occurrence of dead or injured ESA-listed birds or bats (as well as eagles protected under the Bald and Golden Eagle Protection Act) be reported as soon as practicable, which would improve the understanding of ESA-listed bird interactions with wind farms.
BB-2	This measure proposes annual reporting requirements for dead or injured birds or bats, which would improve the overall understanding of bird interactions with wind farms.
BB-3	This measure proposes lessees prepare and implement a *Bird and Bat Post-Construction Monitoring Plan*, which would include monitoring, reporting requirements, and adaptive management to reduce impacts on birds from offshore wind farms.
BIR-1	This measure proposes preparation of a bird perching deterrent plan subject to agency review and implementation of bird perching-deterrents on WTGs and OSSs to reduce potential bird collisions with WTGs.
BIR-2	This measure proposes use of lighting technology that minimizes impacts on avian species to the extent practicable, including lighting designed to minimize upward illumination.
BIR-3	This measure proposes preparation of a *Compensatory Mitigation Plan* and implementation of compensatory mitigation actions to offset take of the ESA-listed piping plover and red knot.
MUL-37	This measure proposes use of an ADLS system on offshore structures to minimize light pollution and species impacts, while ensuring the structures are visible to aircraft.

Impacts of One Project

The identification of AMMM measures under Sub-alternative C1 could potentially reduce impacts on birds compared to those under Alternative B for the lighting and presence of structures IPFs. Impacts for other IPFs would remain the same as described under Alternative B.

Lighting: Implementation of an ADLS system on WTGs (MUL-37) could reduce potential collisions with WTGs. Because WTG lighting can attract some birds and has the potential to pose an increased collision or predation risk to migrating birds, an ADLS system would reduce this risk by significantly reducing the amount of time lights on WTGs would be illuminated. For comparison, the nearby Empire Wind (OCS-A 0512) ADLS-controlled obstruction lights are estimated to be activated for 357 hours, 46 minutes, and 45 seconds over a 1-year period, 7.5 percent of the normal operating time that would occur without ADLS. Using lighting technology on offshore structures that is designed to minimize upward illumination (BIR-2) could also minimize the potential for these lights to be an attractant to migratory birds and reduce the potential for collision with WTGs. While this measure could further minimize potential collisions in addition to implementing an ADLS system (MUL-37), it is unlikely that there would be a substantial additive effect. However, implementing MUL-37 and BIR-2 could reduce the overall potential lighting impacts on birds from moderate to minor.

Presence of structures: The implementation of a *Bird and Bat Post-Construction Monitoring Plan* (BB-3) would support improvement of the overall understanding of bird interactions with offshore wind farms through monitoring, reporting requirements, and adaptive management. Depending on the results of the post-construction monitoring, new mitigation and monitoring measures may be required by BOEM if impacts on birds in the offshore environment are considerably different from the impact analysis. The immediate reporting of dead or injured ESA-listed birds and annual reporting of any dead or injured birds would improve overall understanding of bird interactions with offshore wind and may reduce overall impacts on birds over time (BB-1, BB-2). Dead bird reporting could also lead to new mitigation or monitoring methods to reduce impacts on birds.

In addition to monitoring and reporting measures, Sub-alternative C1 includes measures to avoid direct impacts on birds in the offshore environment. Implementation of bird deterrent devices on WTGs and OSSs (BIR-1), along with adaptive management to modify deterrent design based on ongoing monitoring, would minimize the attraction of birds to WTGs and the potential for collisions.

To mitigate impacts on ESA-listed birds, lessees would be required to develop and implement a Compensatory Mitigation Plan that would include compensatory mitigation actions to offset take of ESA-listed piping plover and red knot (BIR-3). This measure would ensure that impacts on piping plover and red knot are compensated for, which would reduce impacts on ESA-listed species but impacts on other bird species would not be affected.

Overall, while the identification of the AMMM measures under Sub-alternative C1 for this IPF could reduce impacts on birds, BOEM anticipates the bird impacts from presence of structures from one project in the NY Bight lease areas would be similar to Alternative B and remain minor. This impact determination is primarily based on the low presence of birds in the offshore environment and the avian risk analyses conducted by nearby lease areas indicating low risk.

Impacts of Six Projects

Even with the identification of the AMMM measures under Sub-alternative C1, potential impacts on birds within the NY Bight lease areas under six projects is not anticipated to be different compared to a single NY Bight project due to the low presence of birds on the OCS and the unknown bird habitat impacts that could occur in the onshore environment. For the same reasons, the potential impacts on birds for six NY Bight projects under Sub-alternative C1 compared to six NY Bight projects under Alternative B are not anticipated to be substantially different.

Impacts of Sub-Alternative C1 (Preferred Alternative) on ESA-Listed Species

The identification of AMMM measures would result in similar reductions in impacts for ESA-listed birds as described for all birds for one NY Bight project and six NY Bight projects, with the exception of AMMM measures BB-1 and BIR-3, which are designed specifically to mitigate impacts on ESA-listed species. BB-1 and BIR-3 would improve understanding of ESA-listed bird interactions with WTGs through immediate reporting requirements and use compensatory mitigation actions to offset take of piping plover and red knot, respectively. As stated previously, the presence of ESA-listed bird species in the offshore environment would generally be limited, with more potential effects occurring from onshore activities.

Cumulative Impacts of Sub-Alternative C1 (Preferred Alternative)

Under Sub-alternative C1, the cumulative impacts on birds would likely be moderate because, although bird abundance on the OCS is low, there could be unavoidable impacts offshore and onshore. However, BOEM does not anticipate the impacts to result in population-level effects or threaten overall habitat function. In addition, the AMMM measures may not substantially change the potential effect on bird populations. Onshore habitat loss may be reduced if lessees design the onshore project components to avoid sensitive onshore bird habitat, but there is still the possibility of larger habitat areas being removed, which could still result in potential moderate impacts from land disturbance. In the context of other reasonably foreseeable environmental trends, BOEM anticipates the impact of Sub-alternative C1 to the cumulative accidental releases, lighting, cable emplacement and maintenance, noise, presence of structures, traffic (aircraft), and land disturbance impacts on birds would be undetectable.

3.5.3.5.2 Sub-Alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any AMMM measures that have not been previously applied for birds, and, therefore, the impacts on birds under Sub-alternative C2 are the same as Sub-alternative C1 and Alternative B.

3.5.3.5.3 Conclusions

Impacts of Alternative C. Construction, installation, and conceptual decommissioning of one NY Bight project or six NY Bight projects under Sub-alternative C1 or Sub-alternative C2 would likely have **negligible** to **moderate** impacts on birds, depending on the duration of activities performed and how much onshore habitat would be removed. The AMMM measures under Sub-alternative C1 and Sub-alternative C2 would provide some certainty in reducing impacts on birds in the offshore environment and, therefore, could reduce potential impacts on birds compared to those under Alternative B. However, bird presence in the offshore environment is anticipated to be low and the AMMM measures may not significantly reduce impacts. Like Alternative B, onshore habitat impacts under Sub-alternatives C1 and C2 could be reduced by lessees designing the projects to avoid onshore bird habitat. However, because the location of onshore infrastructure is not known, there could still be a range of potential impacts on habitat regardless of the AMMM measures, resulting in negligible to moderate impacts. Noise effects from construction are expected to be limited to temporary and localized behavioral avoidance that would cease once construction is complete. Sub-alternatives C1 and C2 could also result in **minor beneficial** impacts associated with foraging opportunities for some marine birds, and **minor** to **moderate beneficial** impacts on populations of small land birds due to the reduction in ozone from displacement of fossil fuels in the generation of electricity by offshore wind.

Cumulative Impacts of Alternative C. BOEM expects that the cumulative impacts on birds under Sub-alternative C1 and Sub-alternative C2 in the geographic analysis area would likely be **negligible** to **moderate** and **minor** to **moderate beneficial** for six NY Bight projects. In context of reasonably foreseeable environmental trends, the impact of Sub-alternative C1 and Sub-alternative C2 to the cumulative impacts on birds would be undetectable. Because the occurrence of most local bird species offshore is low, Sub-alternative C1 and Sub-alternative C2 would contribute to the cumulative impacts primarily through the long-term impacts from onshore habitat loss related to onshore substations and cables. The extent of onshore habitat impacts is not known at this time because the location of onshore infrastructure is not known, regardless of the absence of land disturbance AMMM measures.

3.5.3.6 Recommended Practices for Consideration at the Project-Specific Stage

In addition to the AMMM measures identified under Alternative C, BOEM is recommending lessees consider analyzing the RPs in Table 3.5.3-7 to further reduce potential bird impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.5.3-7. Recommended Practices for bird impacts and related benefits

Recommended Practice	Potential Benefit
BB-4: Prepare a framework for a *Bird and Bat Post-Construction Monitoring Plan* to be submitted with the COP.	Developing a framework for a *Bird and Bat Post-Construction Monitoring Plan* would provide the public and agencies an opportunity to provide early feedback on the plan.
MUL-5: Use equipment, technology, and best practices to produce the least amount of noise possible to reduce noise impacts.	Using noise reduction measures to produce the least amount of noise practicable would likely minimize disturbance/displacement impacts.

Recommended Practice	Potential Benefit
MUL-21: Use the best available technology, including new and emerging technology, when possible, to reduce impacts, such as the use of MERLIN radar systems.	Assessing and monitoring bird mortality risk through radar sensors and bird-detection software (e.g., MERLIN) would provide information on avian occurrence in a wind farm area and could be used to inform post-construction operational mitigation.
MUL-23: Consider how to avoid or reduce potential impacts on important environmental resources by adjusting project design as part of COP submittal, which may minimize impacts on birds associated with onshore activities.	Adjusting project design to minimize impacts, such as routing cable in previously disturbed areas, has the potential to reduce impacts on individual birds and their habitats from onshore activities.
MUL-25: Use consistent turbine grid layouts, markings, and lighting in lease areas. Turbines should have one of the two lines of orientation in the grid layout spaced at least 1 nm apart.	Providing more structure-free areas in the lease area and reducing the total number of structures would potentially reduce interactions between birds and WTGs.
MUL-26: Coordinate for regional monitoring and surveys.	Coordinating monitoring and survey efforts across lease areas in the NY Bight to standardize approaches would contribute to understanding potential impacts on birds at a regional scale.
VIS-6: Ensure lighting at onshore and offshore facilities follows night lighting principles and artificial lighting BMPs to avoid light pollution.	Minimizing lighting onshore and offshore would reduce bird attraction to lighting, which would reduce potential collision risk.

3.5 Biological Resources

3.5.4 Coastal Habitat and Fauna

This section discusses potential impacts on coastal habitat and fauna from the Proposed Action, alternatives, and ongoing and planned activities in the geographic analysis area. The coastal habitat and fauna geographic analysis area, as shown on Figure 3.5.4-1, extends from the shoreline inland 1 mile (1.6 kilometers) where onshore infrastructure may be located (e.g., cable landfalls, onshore cable laying, substations/converter stations) and includes the foreshore, backshore, dunes, and interdunal areas as well as vegetation communities. BOEM expects the resources in this area to have small home ranges, and they are unlikely to be affected by impacts outside these home ranges. The 1-mile (1.6-kilometer) inland buffer was used for the analysis area although it is most likely that the onshore infrastructure for future projects would be farther inland. However, because the location of onshore components is unknown, and the existing land use farther inland includes a diverse mix of land use types and previously disturbed areas (see Section 3.6.5, *Land Use and Coastal Infrastructure*), the 1-mile (1.6-kilometer) buffer is used for the geographic analysis area for coastal habitat and fauna. Future project-specific impacts would predominantly be in these already disturbed areas; therefore, at the programmatic level, this 1-mile (1.6-kilometer) buffer is an appropriate geographic analysis area for coastal habitat and fauna.

The affected environment and environmental consequences of project activities that extend into inshore waters (e.g., HDD for cable landfalls) are presented in Section 3.4.2, *Water Quality*; Section 3.5.2, *Benthic Resources* (e.g., soft and hardbottom habitat, mollusk reef biota, submerged aquatic vegetation [SAV]); Section 3.5.5, *Finfish*, *Invertebrates*, *and Essential Fish Habitat*; Section 3.5.6, *Marine Mammals*; and Section 3.5.7, *Sea Turtles*. Additional information on birds, bats, and wetlands is presented in Section 3.5.1, *Bats*; Section 3.5.3, *Birds*; and Section 3.5.8, *Wetlands,* respectively.

The coastal habitat and fauna impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Because the locations of onshore components for the NY Bight projects are not known at this time, the analysis of onshore coastal habitat and fauna impacts is dependent on a hypothetical project analysis, and impact conclusions consider a maximum-case scenario for onshore development. Additional detailed site-specific analysis will be required for individual COPs. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

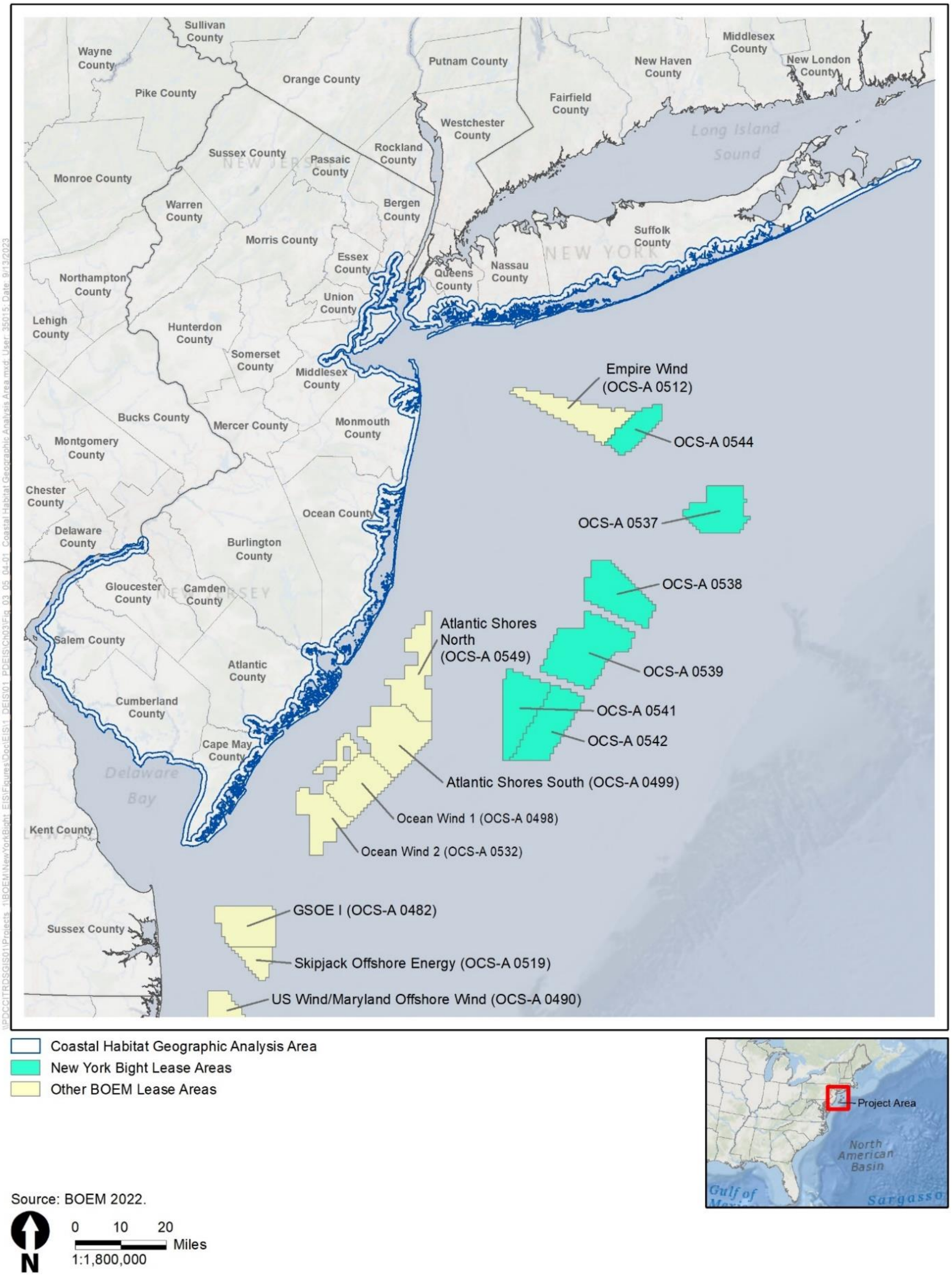


Figure 3.5.4-1. Coastal habitat and fauna geographic analysis area

3.5.4.1 Description of the Affected Environment and Future Baseline Conditions

3.5.4.1.1 Coastal Habitat

This section describes vegetation communities under existing conditions in upland portions of the geographic analysis area and includes information about species and habitats within the onshore area. The *Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf* (MMS 2007) includes a general description of the affected environment for coastal habitats along the entire Atlantic coast and is hereby incorporated by reference and summarized here. The NY Bight lease areas are located offshore of the Atlantic coastal plain. This plain is a flat stretch of land that borders the Atlantic Ocean for approximately 2,200 miles (3,541 kilometers) from Cape Cod through the southeast United States. The coastal resources of the New York and New Jersey shorelines include sandy beaches, coarse-grained beaches, cliffs, coastal dune systems, and barrier island forests. These habitats and the species present within them are described in detail in the aforementioned PEIS (MMS 2007). Descriptions of site-specific coastal habitats present in the NY Bight are included below.

New York has 120 miles (193 kilometers) of coastline bordering the Atlantic Ocean between Coney Island and Montauk (Tanski 2012). Most of the ocean-facing barrier islands along the south shore of Long Island consist of fine- to medium-grained sand beaches, solid human-made structures (e.g., docks, marinas, jetties, seawalls), and rip-rap (ESI 2009). North-facing shores of the barrier islands border the Great South Bay. Farther west and deeper into the New York-New Jersey harbor, the shoreline is composed of rocky, exposed cliffs, human-made structures, and coarse-grained sand and gravel beaches and eroding scarps (ESI 2001).

New Jersey has 127 miles (204 kilometers) of oceanfront shoreline, much of which is densely populated; however, about 31 miles (50 kilometers) of non-contiguous shoreline between Sandy Hook and Cape May Point has no human-made barriers between land and water (Stockton University 2015). In northern New Jersey, much of the shoreline around Raritan Bay is composed of coarse-grained beaches, mixed-sand and gravel, and rip-rap (NJDEP 2002). Common onshore habitats include forested areas, New Jersey pinelands, Atlantic White Cedar swamp, and beaches and dunes.

Forested Areas

The forested areas of the onshore project area consist of lowland forest and upland forest. Lowland forests are characterized by Atlantic white-cedar (*Chamaecyparis thyoides*) and other broadleaf species. Along the edges of the lowlands are occasional gray birch (*Betula populifolia*), willow oak (*Quercus phellos*), sweet gum (*Liquidambar styraciflua*), and several other water-tolerant lowland species. Lowland forest communities include cedar swamps, hardwood swamps, and pine lowlands. Upland forests are characterized by pines, especially the pitch pine (*Pinus rigida*) and shortleaf pine (*P. echinata*). As compared to the lowlands, the canopy is more varied in composition. Pitch pine is the most abundant, and its associations include shortleaf pine and oaks. Communities within the upland association include pine-black oak (*Q. velutina*), pine-black oak-scrub oak (*Q. berberidifolia*), and oak-pine.

New Jersey Pinelands

Outside of the coastal zone, portions of the onshore geographic analysis area may overlap with mapped New Jersey Pinelands National Reserve. The pinelands ecosystem is an expansive area in southern New Jersey characterized by unconsolidated sand and gravel with a shallow, but characteristically acidic and nutrient-poor aquifer where the plant and animal species have adapted to challenging conditions, particularly wildland fire. Many plant and animal species known to occur in the pinelands require occasional wildfires to maintain habitat conditions and provide opportunities for reproduction. The Pinelands National Reserve area is managed by the Pinelands Commission and is defined by three separate zones: protected areas, managed use areas, and zones of cooperation. The onshore geographic analysis area may overlap with the Pinelands National Reserve areas that are designated as a "Regional Growth Area" which are managed use areas, or Pinelands National Reserve areas designated "protected areas" (State of New Jersey 2021a, 2021b; Pinelands Preservation Alliance 2021).

Atlantic White Cedar Swamp

Atlantic white cedar swamps are prevalent in coastal New Jersey along riverine areas. This community is typically dominated by Atlantic white cedar surrounded by hummocks of sphagnum mosses (*Sphagnum spp*.) with wildflowers, grasses, sedges, rushes, and other species also present (Pinelands Reserve Alliance 2018). Wetlands are further discussed in Section 3.5.8.

Beaches and Dunes

There are many beaches along the New Jersey and New York coastlines. Beach and dune communities are found within the onshore geographic analysis area. These features are generally located along the barrier beach system of the Atlantic shoreline. Dune communities are protected under both New Jersey's and New York's Coastal Zone Management Programs as they provide special protection from coastal storms. Additionally, many beach and dune communities are protected from development if they are located within state parks or wildlife refuges, or if they are federally managed land such as Fire Island National Seashore. In general, while these communities are typically sparsely populated primarily with dune grasses that protect the dunes and assist in sand accretion (USEPA 2012), these habitats are used by many species, including federally and state-listed species such as migratory birds, butterflies, and bats.

Coastal Barrier Resources System

The Coastal Barrier Resources Act (CBRA) protects coastal areas that serve as barriers against wind and tidal forces caused by coastal storms and serve as habitat for aquatic species. The CBRA designated relatively undeveloped coastal barriers along the Atlantic and Gulf coasts as part of the John H. Chafee Coastal Barrier Resources System (BOEM and NOAA 2018). The CBRA encourages the conservation of hurricane-prone, biologically rich coastal barriers by restricting federal expenditures that encourage development (BOEM and NOAA 2018). Several Coastal Barrier Resources Systems are found within the geographic analysis area along coastal New Jersey.

3.5.4.1.2 Coastal Flora

The Atlantic Coast of the United States supports a great diversity of terrestrial biota. This diversity is a function of the combinations of geology, topography, and climate that occur along the coast from the Florida Keys to the Canadian border in Maine and the ecoregions that encompass these areas. The eastern Atlantic Coast falls into six ecoregions, each with a relatively unique ecosystem and biota; three occur in the geographic analysis area and include the Middle Atlantic Coastal Plain, Atlantic Coastal Pine Barrens, and Northeastern Coastal Zone.

Middle Atlantic Coastal Plain (Southern New Jersey)

This ecoregion consists of low elevation flat plains, with many swamps, marshes, and estuaries. Forest cover in the region is mostly loblolly and some shortleaf pine, with patches of oak, gum, and cypress near major streams. Its low terraces, marshes, dunes, barrier islands, and beaches are underlain by unconsolidated sediments (MMS 2007).

Atlantic Coastal Pine Barrens (New Jersey, New York)

This ecoregion is distinguished from the Middle Atlantic Coastal Ecoregion to the south by its coarser-grained soils, cooler climate, and oak-pine potential natural vegetation. The climate is milder than the Northeastern Coastal Ecoregion to the north, which contains Appalachian Oak forests and some Northern hardwood forests. The physiography of this ecoregion is not as flat as that of the Middle Atlantic Coastal Plain, but it is not as irregular as that of the Northeastern Coastal Zone (MMS 2007).

Northeastern Coastal Zone (New York)

This ecoregion contains relatively nutrient-poor soils and concentrations of continental glacial lakes, some of which are sensitive to acidification; however, this ecoregion contains considerably less surface irregularity and much greater concentrations of human population (MMS 2007). Land use now mainly consists of forests and residential development. Land cover and use is further discussed in Section 3.6.5.

3.5.4.1.3 Coastal Fauna

Coastal areas, including beaches and dunes, provide habitat for many different types of fauna. Beaches and dunes are important habitats for migrating and nesting shorebirds and songbirds. The beaches, dunes, and scrub-shrub habitats along the shoreline may support commonly found species such as the double-crested cormorant (*Phalacrocorax auritus*), ring-billed gull (*Larus delawarensis*), great blue heron (*Ardea herodias*), sanderling (*Calidris alba*), and brown pelican (*Pelecanus occidentalis*); see Section 3.5.3, *Birds,* for additional information.

Wildlife expected to be present along the onshore export cable corridor or at the onshore substation construction area include species known to inhabit forested wetlands, forested lowlands, and upland habitats and pinelands, while wildlife expected to be present along the cable landfall sites includes species known to inhabit coastal wetlands, barrier beaches, and bay island habitats.

Typical species found in coastal areas of New Jersey and New York are shown in Table 3.5.4-1, and typical species known to inhabit forested wetland, forested lowland, and upland habitats and pinelands of New Jersey and New York are provided in Table 3.5.4-2.

Table 3.5.4-1. Species typically found in coastal areas of New Jersey and New York

Common Name	Scientific Name	Common Name	Scientific Name
Black Snake	*Pantherophis obsoletus*	Garter Snake	*Thamnophis sirtalis*
Meadow Vole	*Microtus pennsylvanicus*	Porcupine	*Erethizon dorsatum*
Bobcat	*Felis refus*	Deer Mouse	*Peromyscus maniculatus*
Mink	*Neovison vison*	Raccoon	*Procyon lotor*
Bog Lemming	*Synaptomys cooperi*	Northern Diamondback Terrapin	*Malaclemys terrapin*
Eastern Mole	*Scalopus aquaticus*	Red Fox	*Vulpes vulpes*
Bog Turtle	*Glyptemys muhlenbergii*	Eastern Spiny Softshell Turtle	*Apalone spinifera*
Muskrat	*Ondatra zibethicus*	Red Squirrel	*Tamiasciurus hudsonicus*
Box Turtle	*Terrapene carolina carolina*	Eastern Tiger Salamander	*Ambystoma tigrinum*
Northern Scarlet Snake	*Cemophora coccinea copei*	Rice Rat	*Oryzomys palustris*
Brown Bat	*Myotis lucifugus*	Flying Squirrel	*Glaucomys volans*
Norway Rat	*Rattus norvegicus*	River Otter	*Lontra canadensis*
Eastern Chipmunk	*Tamias striatus*	Fowler’s Toad	*Anaxyrus fowleri*
Virginia Opossum	*Didelphis virginiana*	Shrew	*Blarina brevicauda*
Corn Snake	*Pantherophis guttatus*	Skunk	*Mephitis mephitis*
Pine Barrens Tree Frog	*Hyla andersonii*	Gray Tree Frog	*Hyla chrysoscelis*
Cottontail Rabbit	*Sylvilagus floridanus*	Spring Peeper	*Pseudacris crucifer*
Gray Fox	*Urocyon cinereoargenteus*	Gray Squirrel	*Sciurus carolinensis*
Timber Rattlesnake	*Crotalus horridus*	Weasel	*Mustela frenata*
Ground Skink	*Scincella lateralis*	House Mouse	*Mus musculus*
White-footed Mouse	*Peromyscus leucopus*	White-tailed Deer	*Odocoileus virginianus*
Meadow Mouse	*Microtus pennsylvanicus*		

Table 3.5.4-2. Species known to inhabit forested wetland, forested lowland, and upland habitats and pinelands of New Jersey and New York

Common Name	Scientific Name	Common Name	Scientific Name
American Bittern	*Botaurus lentiginosus*	Northern Diamondback Terrapin	*Malaclemys terrapin*
Eastern Chipmunk	*Tamias striatus*	White-tailed Deer	*Odocoileus virginianus*
Red Fox	*Vulpes vulpes*	Virginia Opossum	*Didelphis virginiana*
Gray Fox	*Urocyon cinereoargenteus*	Raccoon	*Procyon lotor*
Red Squirrel	*Tamiasciurus hudsonicus*	Eastern Mole	Scalopus aquaticus
Gray Squirrel	*Sciurus carolinensis*	Northern Harrier	*Circus hudsonius*
Eastern Cottontail	*Sylvilagus floridanus*	Northern Pine Snake	*Pituophis melanoleucus*
Eastern Hognose Snake	*Heterodon platirhinos*	Osprey	*Pandion haliaetus*
Eastern Meadowlark	*Sturnella magna*	Pine Siskins	*Spinus pinus*
Finches	*Fringillidae sp.*	Red Bat	*Lasiurus borealis*
Grasshopper Sparrow	*Ammodramus savannarum*	Red-backed Salamander	*Plethodon cinereus*
Horned Lark	*Eremophila alpestris*	Savannah Sparrow	*Passerculus sandwichensis*

Common Name	Scientific Name	Common Name	Scientific Name
Kinglets	*Regulus spp.*	Little Blue Heron	*Egretta caerulea*
Masked Shrew	*Sorex cinereus*	Woodchuck	*Marmota monax*
Northern Black Racer	*Coluber constrictor*		

For any onshore project components located predominantly within developed lands, the project area would be generally most suitable for species common to urban environments, comprising sparsely vegetated and highly fragmented habitats, including mammals such as Virginia opossum, eastern cottontail, gray squirrel, meadow vole, Norway rat, house mouse, raccoon, and striped skunk. Bird species likely to utilize these urban habitats include house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), gulls, and rock pigeon (*Columba livia*) (see Section 3.5.3 for further discussion of avian species).

3.5.4.1.4 Federal and State-Listed Coastal Species

Under the ESA, the New Jersey Endangered and Nongame Species Program, and the New York Endangered Species Program, species and their habitats potentially impacted by construction and operation of offshore wind projects would require further evaluation to determine presence of habitat and individuals in the geographic analysis area and its immediate vicinity. These evaluations would be required to support federal and state permit requirements.

Special concern species that could potentially occur in these areas include but are not limited to the spotted turtle (*Clemmys guttata*) and the eastern box turtle (*Terrapene carolina carolina*). Seaside sandplant (*Honckenya peploides* var. *robusta*), sea-beach knotweed (*Polygonum glaucum*), seabeach sedge (*Carex silicea*), and sickle-leaf golden-aster (*Pityopsis falcate*) are plant species of concern known to occur in the barrier islands of the geographic analysis area. Federal and state listed threatened and endangered species found in or in the vicinity of the geographic analysis area for coastal habitat and fauna are presented in Table 3.5.4-3. Additional information on other Threatened and Endangered species that may occur in or near the coastal habitat areas can be found in Section 3.5.1, *Bats*; Section 3.5.3, *Birds;* Section 3.5.5, *Finfish*, *Invertebrates*, *and Essential Fish Habitat*; Section 3.5.6, *Marine Mammals*; and Section 3.5.7, *Sea Turtles*.

Table 3.5.4-3. Summary of potential threatened and endangered species in or in the vicinity of the geographic analysis area for coastal habitat and fauna

Common Name	Scientific Name	Taxonomic Group	Federal Status	State Status
Flora				
American Chaffseed	*Schwalbea americana*	Plant	Endangered	Unlisted
Knieskern's Beaked-rush	*Rhynchospora knieskernii*	Plant	Threatened	Unlisted
Sandplain Gerardia	*Agalinis acuta*	Plant	Endangered	NY Endangered
Seabeach Amaranth	*Amaranthus pumilus*	Plant	Threatened	NY Threatened
Sensitive Joint-vetch	*Aeschynomene virginica*	Plant	Threatened	Unlisted
Small whorled pogonia	*Isotria medeoloides*	Plant	Threatened	NY, NJ Endangered
Swamp Pink	*Helonias bullata*	Plant	Threatened	NJ Endangered

Common Name	Scientific Name	Taxonomic Group	Federal Status	State Status
Fauna				
Bobcat	*Lynx rufus*	Mammal	Unlisted	NJ Endangered
Harlequin Duck	*Histrionicus*	Bird	Unlisted	Unlisted
Common Tern	*Sterna hirundo*	Bird	Unlisted	NY Threatened
Forster's Tern	*Sterna forsteri*	Bird	Unlisted	Unlisted
Gull-Billed Tern[1]	*Gelochelidon nilotica*	Bird	Unlisted	Unlisted
Least Tern[1]	*Sterna antillarum*	Bird	Threatened	Unlisted
Black Skimmer[1]	*Rynchops niger*	Bird	Unlisted	Unlisted
Piping Plover	*Charadrius melodus*	Bird	Threatened	NY Endangered
Rufa Red Knot	*Calidris canutus rufa*	Bird	Threatened	NY Threatened
Roseate Tern	*Sterna dougallii*	Bird	Endangered	NY Endangered
Bog Turtle	*Clemys muhlenbergii*	Reptile	Threatened	NJ Endangered
Corn Snake	*Pantherophis guttatus*	Reptile	Unlisted	NJ Endangered
Northern Pine Snake	*Pituophis melanoleucus melanoleucus*	Reptile	Unlisted	NJ Threatened
Timber Rattlesnake	*Crotalus horridus horridus*	Reptile	Unlisted	NJ Endangered
Wood Turtle	*Glyptemus insculpta*	Reptile	Unlisted	NJ Threatened
Cope's Gray Treefrog (southern gray treefrog)	*Hyla chrysoscelis*	Amphibian	Unlisted	NJ Endangered
Pine Barrens Treefrog	*Hyla andersonii*	Amphibian	Unlisted	NJ Threatened
American burying beetle	*Nicrophorus americanus*	Insect	Threatened	NJ Endangered
Monarch Butterfly	*Danaus plexippus plexippus*	Insect	Candidate	Unlisted
Northeastern beach tiger beetle	*Habroscelimorpha dorsalis dorsalis*	Insect	Threatened	NJ Endangered
Rusty patched bumble bee	*Bombus affiniss*	Insect	Endangered	Unlisted

[1] Species considered Birds of Conservation Concern by USFWS (USFWS 2021).

3.5.4.2 Impact Level Definitions for Coastal Habitat and Fauna

Definitions of potential impact levels are provided in Table 3.5.4-4. Beneficial impacts on coastal habitat and fauna are described using the definitions described in Section 3.3.2 (see Table 3.3-1).

Table 3.5.4-4. Adverse impact level definitions for coastal habitat and fauna

Impact Level	Definition
Negligible	There would be no measurable impacts on species or habitat, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Most impacts on species would be avoided; if impacts occur, they may result in the loss of a few individuals. Impacts on sensitive habitats would be avoided; impacts that do occur are temporary or short term in nature.
Moderate	Impacts on species would be unavoidable but would not result in population-level effects. Impacts on habitat may be short term, long term, or permanent and may include impacts on sensitive habitats but would not result in population-level effects on species that rely on them.
Major	Impacts would affect the viability of the population and would not be fully recoverable. Impacts on habitats would result in population-level impacts on species that rely on them.

BOEM expects that planned offshore wind projects in the NY Bight lease area would be designed to avoid important coastal habitat (e.g., wetlands) to the extent feasible, and would be required to comply with federal, state, and local regulations related to the protection of sensitive habitats and species by avoiding or minimizing impacts. Given the extent of sensitive coastal habitats, complete avoidance is often not possible; however, AMMM measures are proposed in Alternative C to minimize and mitigate impacts.

Accidental releases, land disturbance, noise, and traffic are contributing IPFs to impacts on coastal habitat and fauna. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.5.4-5.

Table 3.5.4-5. Issues and indicators to assess impacts on coastal habitats and fauna

Issue	Impact Indicator
Habitat loss/ modification	Area of impacted habitat
Disturbance/ displacement	Changes to noise levels Projected traffic patterns/volume changes Qualitative assessment of potential ingestion or ensnarement from trash/debris
Collision/injury	Qualitative estimate of collision risk

3.5.4.3 Impacts of Alternative A – No Action – Coastal Habitat and Fauna

When analyzing the impacts of the No Action Alternative on coastal habitat and fauna, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for coastal habitat and fauna. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with the other planned non-offshore-wind and offshore wind activities, which are described in Appendix D, *Planned Activities Scenario*.

3.5.4.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for coastal habitat and fauna would continue to follow current regional trends and respond to IPFs introduced by other ongoing activities. Ongoing activities within the geographic analysis area that contribute to impacts on coastal habitat and fauna are generally associated with onshore impacts, including onshore residential, commercial, and industrial development (see Section D.2 in Appendix D for a description of ongoing activities), and climate change. Mainland coastal habitat in the geographic analysis area for coastal habitat and fauna mostly consists of sandy beach and dune vegetation; much of this is developed for the public beach and private residences. Any new structures along the coast, including developments, roads, utilities, marinas and ports, and shoreline protection measures, are anticipated to increase gradually, altering coastal habitat. Development is likely to continue as resident and vacationer populations expand. However, it is important to note that New York and New Jersey State agencies have regulations on coastal development to protect and preserve existing natural resources; while development is likely to continue, much of it will be done in accordance with state regulations to protect the natural environment, including coastal habitat and fauna. Onshore construction activities have the potential to affect coastal habitat and fauna through temporary and permanent habitat removal or conversion and temporary noise impacts during construction, which could cause avoidance behavior and displacement of animals, as well as injury or mortality to individual animals or loss and alteration of vegetation and individual plants. However, population-level effects would not be anticipated. Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on coastal habitat and fauna include ongoing construction of Ocean Wind 1 (OCS-A 0498), South Fork Wind (OCS-A 0517), Sunrise Wind (OCS-A 0487), and Empire Wind (OCS-A 0512) 1 and 2. Ongoing construction of Ocean Wind 1, South Fork Wind, Sunrise Wind, and Empire Wind 1 and 2 would have the same types of impacts on coastal habitat and fauna that are described in Section 3.5.4.3.3, *Cumulative Impacts of the No Action Alternative,* for all ongoing and planned offshore wind activities in the geographic analysis area, but would be of lower intensity.

Climate change and associated sea level rise results in dieback of coastal habitats caused by rising groundwater tables and increased saltwater inundation from storm surges and exceptionally high tides (Sacatelli et al. 2020). Sandy beaches in the geographic analysis area are subject to erosion and vulnerable to the effects of projected climate change and relative sea level rise (Roberts et al. 2015) including ocean acidification and ocean warming. Climate change may also affect coastal habitats through increases in instances and severity of droughts and range expansion of invasive species. Warmer temperatures will cause plants to flower earlier, will not provide needed periods of cold weather, and will likely result in declines in reproductive success of plant and pollinator species (Cassota et al. 2019). Reptile and amphibian populations may experience shifts in distribution, range, reproductive ecology, and habitat availability. Increased temperatures could lead to changes in mating, nesting, reproductive, and foraging behaviors of species, including a change in the sex ratios in reptiles with temperature-dependent sex determination (Cassota et al. 2019).

Climate change factors have accounted for the loss of approximately 3.4 million acres (1.4 million hectares) of forested coastal wetlands across the north Atlantic coastal plain between 1996 and 2016 (White et al. 2021). If sea levels rise approximately 2 feet (0.6 meter) by the end of the century, over 167,000 acres (67,582 hectares) of undeveloped dry land and approximately 161,000 acres (65,154 hectares) of brackish marsh would be lost, replaced in part by over 266,000 acres (107,646 hectares) of newly open water and 50,000 acres (20,234 hectares) of salt marsh (Glick et al. 2008).

3.5.4.3.2 Impacts of the No Action Alternative on ESA-Listed Species

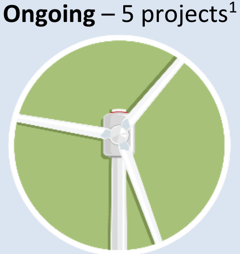
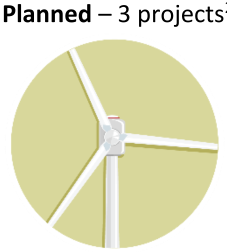
The species discussed in Table 3.5.4-3 may be affected by offshore wind activities. The IPFs described previously for coastal habitat and fauna would also apply to ESA-listed species. Any future federal activities that could affect ESA-listed species would need to comply with ESA Section 7 to ensure that the proposed activities do not jeopardize the continued existence of the species. Future non-federal activities would be addressed under ESA Section 10 to ensure that the proposed activities do not jeopardize the continued existence of individual species.

3.5.4.3.3 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the development of the NY Bight projects).

Planned non-offshore-wind activities that may affect coastal habitat and fauna primarily include increasing onshore development activities (see Section D.2 in Appendix D for a description of ongoing and planned activities). Other planned non-offshore-wind activities that may affect coastal habitat and fauna include new submarine cables, transmission systems (e.g., PBI), and pipelines, oil and gas activities, marine minerals extraction, port expansions, and installation of new structures on the OCS (see Appendix D for a description of planned activities). Planned transmission infrastructure, such as PBI, would likely be primarily co-located with existing roads and rights-of way. These activities may result in temporary or permanent landscape alteration or displacement and injury or mortality to individual plants and animals, but population-level effects would not be expected for flora and fauna. Habitat and plant degradation and loss as well as habitat conversion may also occur. Ongoing and planned offshore wind activities that could potentially overlap the coastal habitat and fauna geographic analysis area are listed in Table 3.5.4-6.

Table 3.5.4-6. Ongoing and planned offshore wind in the geographic analysis area for coastal habitat and fauna

Ongoing/Planned	Projects by Region
Ongoing – 5 projects[1] 	**MA/RI** • South Fork Wind (OCS-A 0517) • Sunrise Wind (OCS-A 0487) **NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 3 projects[2] 	**NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499)

MA = Massachusetts; NJ = New Jersey; NY = New York; RI= Rhode Island
[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.
[2] Status as of September 20, 2024.

BOEM expects ongoing and planned offshore wind activities to affect coastal habitat and fauna through the following primary IPFs.

Accidental releases: Accidental releases of fuels, lubricating oils, and other petroleum compounds may increase as a result of offshore wind activities. The risk of any type of accidental release would increase primarily during construction, but also could occur during operations and conceptual decommissioning of offshore wind facilities. Onshore, the use of heavy construction equipment could result in releases of fuel and lubricating and hydraulic oils during equipment use or refueling. Accidental releases may cause onshore habitat contamination from releases, cleanup activities, or both, although the volume of spilled material is anticipated to be low. Proper waste handling and cleanup procedures would minimize the potential for accidental releases and ensure spills are cleaned up promptly. There is no evidence that the anticipated volumes of accidental releases combined with cleanup measures would have measurable impacts on coastal habitat and fauna; therefore, impacts would be negligible. See Section 3.4.2.1, *Description of the Affected Environment and Future Baseline Conditions* for water quality, for quantities and details. As described in Section 2.3, *Non-Routine Activities and Events*, accidental releases of chemicals, gases, or man-made debris may occur as a result of a structural failure and could result in impacts on coastal habitat and fauna.

Land disturbance: Ground-disturbing activities from construction of onshore components could contribute to elevated levels of erosion and sedimentation, but usually not to a degree that affects coastal fauna, assuming that industry standard BMPs are implemented. Land disturbance from erosion and sedimentation associated with planned offshore wind activities, including export cables, landfalls, onshore substations/converter stations, and transmission facilities, would likely result in negligible impacts on coastal habitat and fauna in the geographic analysis area.

Land disturbances related to the onshore construction of facilities associated with offshore wind projects could cause removal of vegetation and conversion of natural coastal habitat to developed space. These land use changes are a frequent occurrence in coastal habitat. Land disturbance that results in onshore land use changes associated with planned offshore wind activities may produce minor impacts on coastal habitat and fauna as BOEM expects that most impacts on species would be avoided and, if impacts occur, they may result in the loss of a few individuals.

Some amount of habitat conversion may also result from port expansion activities required to meet the demands for fabrication, construction, transportation, and installation of wind energy structures. The general trend along the coastal region from Virginia to Maine is that port activity will increase modestly and require some conversion of undeveloped land to meet port demand (Lauriat 2022). This conversion will result in permanent habitat loss for local fauna populations. The increase of port facilities from development of planned offshore wind projects would be a minimal contribution of port expansion required to meet increased commercial, industrial, and recreational demand. See Section, 3.5.2, *Benthic Resources,* for more information on port expansion.

Noise: Onshore noise associated with intermittent construction of planned offshore wind development infrastructure (e.g., export cables, landfalls, onshore substations/converter stations, and transmission facilities) may result in highly localized and short-term impacts, including avoidance and displacement of species, as the land-based construction noise is likely sufficient to temporarily drive away local motile fauna, such as wading birds, from the immediate area during construction. No individual fitness or population-level effects would be anticipated to occur. The noise generated from onshore cable installation and trenching would be temporary and localized, and they would extend only a short distance beyond the cable emplacement corridor, therefore, impacts from noise on coastal habitat and fauna would likely be negligible.

Traffic: Impacts on wildlife and their habitat from vehicle traffic associated with planned offshore wind activities are anticipated to be limited as the onshore geographic analysis area is highly developed and experiences regular traffic. Risks of impacts on wildlife from offshore wind-related vehicle traffic may increase in areas that do not currently experience consistent vehicular traffic (e.g., electric utility and pedestrian/bike lanes ROWs). Vehicle traffic associated with the construction and operation of onshore facilities would represent increases in traffic volume mainly during construction and would be concentrated along the onshore cable routes and at the substations. During construction, mechanized equipment traffic could disturb or displace local wildlife, but these impacts would be similar to those caused by human presence, land disturbance, and noise/vibration that already occur. Any vehicle-related impacts on wildlife are expected to be localized and limited to the duration of construction. Limited mobility species, such as snakes and turtles, have a low probability of directly encountering vehicles because of the limited populations of these types of species proximate to the current high traffic use areas within the onshore areas associated with the planned offshore wind activities. Use of standard erosion and sedimentation control BMPs such as silt fences along the limits of construction would prevent these species from entering the construction work areas. Additionally, vehicle-related impacts on wildlife during routine O&M and conceptual decommissioning activities would be accidental and rare. All other species are expected to temporarily avoid areas of higher vehicle traffic but return once activities have ceased. Any impacts are expected to be highly localized, short-term, and not result in any population-level impacts. As there would likely be no measurable impacts on species or habitat, impacts are expected to be negligible.

3.5.4.3.4 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, coastal habitat and fauna would continue to be affected by existing environmental trends and ongoing activities. BOEM expects ongoing activities to have continuing temporary, long-term, and permanent impacts (disturbance, displacement, injury, mortality, and habitat conversion) on coastal habitat and fauna primarily through onshore construction impacts, noise, traffic, and climate change. Habitat removal from ongoing activities is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the geographic analysis area. The No Action Alternative would likely result in **negligible** to **moderate** impacts, as climate change is predicted to cause notable impacts on coastal habitat and fauna.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and coastal habitat and fauna would continue to be affected by land disturbance and climate change. In addition to ongoing activities, planned activities may also contribute to impacts on coastal habitat and fauna. Planned activities primarily include increasing onshore construction. BOEM anticipates that the overall impacts associated with the No Action Alternative, when combined with all other planned activities (including offshore wind) in the geographic analysis area, would likely be **negligible** to **moderate** given that any activity would be required to comply with federal, state, and local regulations related to the protection of sensitive habitats and mitigation of impacts, and given the continued impacts of land disturbance and climate change.

3.5.4.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Coastal Habitat and Fauna

3.5.4.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Accidental releases: One NY Bight project would increase the risk of accidental releases of fuels, lubricating oils, and other petroleum compounds, primarily during construction but also during operations and conceptual decommissioning. Onshore, the use of heavy construction equipment could result in releases of fuel and lubricating and hydraulic oils during equipment use or refueling. These potential accidental releases would be of low risk and small quantity, and combined with the cleanup measures in place, the impacts of accidental releases of fuel, fluids, and hazardous materials on coastal habitat and fauna are expected to be minor; the duration of effects from accidental releases would be short- to long term in nature, and most impacts on species are expected to be avoided.

Land disturbance: Land disturbance associated with onshore construction (clearing, grading and excavations) could cause removal of vegetation, temporary disturbance to adjacent land uses (light, noise, and traffic), and disruption of shoreline access. A single NY Bight project could include land disturbance from onshore construction associated with installation of export cables, landfalls, onshore substations and converter stations, and transmission facilities. Impacts on habitat from onshore construction activities is expected to be limited because, based on BOEM’s experience with other offshore wind projects along the Atlantic coast, facilities would most likely be located in existing developed areas, such as roads, parking lots, and utility ROWs. Lighting associated with new onshore substations or converter stations would increase, but the extent of impacts would likely be limited to the immediate vicinity of the lights, and the intensity of impacts on coastal fauna would likely be unmeasurable at a distance. It is anticipated that direct effects on sensitive environmental resources, such as wetlands and forests, would be avoided or minimized to the maximum extent practicable during the design and construction of the project. Once onshore project details are determined during the project-specific COP NEPA stage, the lessees will obtain the proper permits for land disturbance.

Temporary construction impacts on coastal fauna would be limited (see noise and traffic IPFs), as most individuals would avoid the construction areas (Goodwin and Shriver 2010). Land disturbance that does occur, especially on shoreline parcels, could cause short-term erosion and sedimentation impacts in coastal habitat. Altering dune and beach habitat could increase erosion and sedimentation because dune habitat serves as a crucial buffer zone against flooding. Federal and state agencies work with Atlantic coastal towns and other land managers to develop site-specific beach management plans for the protection of federally and state-listed threatened and endangered species. The project-specific COP NEPA analysis will coordinate with local town and/or beach managers once the landing locations are identified to ensure concurrence with local management plans. Overall impacts from land disturbance on coastal habitat and fauna are expected to be minor.

Noise: One NY Bight project would generate noise during construction of onshore infrastructure. Onshore construction noise levels would primarily be limited to daytime hours. This would include noise associated with the construction of cable landfalls, onshore cable installation, and construction of onshore substations or converter stations. While noise from pile driving will not impact nearshore environments, there is the potential for developers to install cofferdams at HDD exit pit sites. Driving of sheet piles for HDD pit cofferdams, if used, could create noise in the nearshore environment. Onshore construction noise and vibration could lead to the disturbance and temporary displacement of mobile species including insects, birds, reptiles, amphibians, and mammals. The noise generated by construction activities, as well as the physical changes to the space, could render an area temporarily unsuitable for fauna or result in masking effects on communication for fauna that remain in the area (Dooling et al. 2019). Because impacts from onshore construction noise would be short term and primarily only occur in the daytime and since most fauna are able to temporarily leave the area where noise is occurring, BOEM expects that no individual fitness or population-level impacts would occur. Therefore, minor impacts on coastal habitat and fauna from one NY Bight project are expected; lasting impacts on local breeding populations are not anticipated.

Normal operation of onshore substations/converter stations would generate localized continuous noise; however, BOEM expects negligible impacts when considered in the context of the other commercial and industrial noises in the geographic analysis area. No measurable impacts on coastal fauna are expected.

Traffic: Impacts on wildlife and their habitat from vehicle traffic associated with a single NY Bight project are anticipated to be similar to the No Action Alternative. Risks of impacts on wildlife from project-related vehicle traffic may increase along the portions of the onshore project area that occur within areas that do not currently experience consistent vehicular traffic (e.g., electric utility and pedestrian/bike lanes ROWs). During construction, mechanized equipment traffic could disturb or displace local wildlife, but these impacts would be similar to those caused by human presence, land disturbance, and noise/vibration that already occur. Any vehicle-related impacts on wildlife are expected to be localized and limited to the duration of construction. Limited mobility species, such as snakes and turtles, have a low probability of directly encountering vehicles because of the limited populations of these types of species proximate to the current high traffic use areas within the onshore geographic analysis area. Collisions between highly mobile fauna and vehicles or construction equipment have some limited potential to cause mortality. Additionally, vehicle-related impacts on wildlife during routine O&M and conceptual decommissioning activities would be accidental and rare. Any impacts are expected to be highly localized and short-term, would not result in any population-level impacts, and therefore would likely be minor.

3.5.4.4.2 Impacts of Six Projects

The same IPF impact types and mechanisms described under one NY Bight project apply to six NY Bight projects. There would be more potential for impacts for these IPFs due to the greater amount of onshore development under six NY Bight projects. However, accidental releases, land disturbance, noise, and traffic impacts are still expected to be minimal. Therefore, impacts under six NY Bight projects are anticipated to have negligible to minor and short-term impacts on coastal habitat and fauna.

The same land disturbance IPF impact types and mechanisms described under one NY Bight project apply to six NY Bight projects. Similar to one NY Bight project, the level of impact on coastal habitat and fauna depends on the amount, function, impact type, and duration of land disturbance. While BOEM anticipates that impacts on coastal habitat and fauna from onshore construction activities under six NY Bight projects would be minimized to the extent practicable (similar to one NY Bight project), it is reasonable to assume that with six NY Bight projects, larger areas of coastal habitat could be temporarily and permanently impacted. Under six NY Bight projects, the potential for this possibility would be greater compared to one NY Bight project due to the increased amount of onshore development that would occur; however, impacts would likely remain minor.

3.5.4.4.3 Impacts of Alternative B on ESA-Listed Species

On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation. The species discussed in Table 3.5.4-3 may be affected by Alternative B. The IPFs described previously for all coastal habitat and fauna would also apply to ESA-listed species. Any future federal activities that could affect ESA-listed species would need to comply with ESA Section 7 to ensure that the proposed activities do not jeopardize the continued existence of the species. Future non-federal activities would be addressed under ESA Section 10 to ensure that proposed activities do not jeopardize the continued existence of individual species.

3.5.4.4.4 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of offshore wind projects across the geographic analysis area would contribute to the primary IPFs of accidental releases, land disturbance, noise, and traffic. Temporary disturbance and permanent loss of coastal habitat may occur as a result of constructing onshore infrastructure such as substations. However, the area of coastal habitat altered or removed could vary widely depending on the specific siting of project components.

The cumulative impacts on coastal habitat and fauna would likely be negligible to moderate because coastal habitat is anticipated to be lost or modified and fauna are anticipated to be disturbed or displaced by onshore construction; however, the level of impact would depend on the area of coastal habitat altered or removed. Impacts on species would be unavoidable; impacts on habitat may be short term, long term, or permanent and may include impacts on sensitive habitats. Impacts on habitat would not result in population-level effects on species that rely on them and therefore would range from negligible to moderate. The cumulative coastal habitat loss from ongoing and planned activities, including the six NY Bight projects, is expected to be moderate but would depend on specific construction activities and their proximity to sensitive habitats and species. If construction of project components of the six NY Bight projects is staggered, there could be less of an effect on coastal habitat and fauna in the short term than if all six projects were constructed at once. In context of reasonably foreseeable environmental trends, BOEM anticipates six NY Bight projects would contribute an undetectable increase to cumulative impacts on coastal habitat and fauna.

3.5.4.4.5 Conclusions

Impacts of Alternative B. Construction and installation, O&M, and conceptual decommissioning of Alternative B, whether one NY Bight project or six NY Bight projects, would likely have **negligible** to **minor** impacts on coastal habitat and fauna, depending on the IPF and the amount and quality of coastal habitat altered or removed. No beneficial impacts would occur. The most significant risk would be from potential onshore removal of habitat, which could lead to fauna mortality and habitat alteration, although BOEM anticipates fauna mortality to be rare and the duration of activities resulting in habitat alteration to be short-term. Impacts are expected to be limited because, based on BOEM's experience with other offshore wind projects along the Atlantic coast, facilities would most likely be located in existing developed areas, such as roads, parking lots, and utility ROWs.

Cumulative Impacts of Alternative B. BOEM anticipates that the cumulative impacts on coastal habitat and fauna in the geographic analysis area would likely be **negligible** to **moderate** for six NY Bight projects. In the context of reasonably foreseeable environmental trends, the impacts contributed by six NY Bight projects to the cumulative impacts on coastal habitat and fauna are likely undetectable. Six NY Bight projects would contribute to the cumulative impacts primarily through the short-term to permanent impacts from onshore habitat loss related to onshore substations/converter stations and cables. Existing environmental trends and ongoing activities would continue, and coastal habitat and fauna would continue to be affected by land disturbance unrelated to the six NY Bight projects and climate change.

3.5.4.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Coastal Habitat and Fauna

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.5.4.5.1 Sub-Alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS and through related consultations. However, BOEM has not identified any AMMM measures for the coastal habitat and fauna; and therefore, the impacts on coastal habitat and fauna under Sub-alternative C1 would be the same as described in Alternative B.

3.5.4.5.2 Sub-Alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any not previously applied AMMM measures for coastal habitat and fauna; therefore, the impacts on coastal habitat and fauna under Sub-alternative C2 are the same as under Sub-alternative C1 (comparable to Alternative B).

3.5.4.5.3 Conclusions

Impacts of Alternative C. BOEM has not identified any AMMM measures for coastal habitat and fauna; therefore, impacts on coastal habitat and fauna under both Sub-alternative C1 and C2 are the same as under Alternative B. Therefore, construction and installation, O&M, and conceptual decommissioning of one NY Bight project or six NY Bight projects under both Sub-alternative C1 and C2 would likely have **negligible** to **minor** impacts.

Cumulative Impacts of Alternative C. BOEM has not identified any AMMM measures for coastal habitat and fauna; therefore, the cumulative impacts on coastal habitat and fauna under both Sub-alternative C1 and C2 are the same as under Alternative B. BOEM anticipates that the cumulative impacts on coastal habitat and fauna in the geographic analysis area would likely be **negligible** to **moderate** for six NY Bight projects.

3.5.4.6 Recommended Practices for Consideration at the Project-Specific Stage

BOEM has not identified any AMMM measures for the coastal habitat and fauna; however, BOEM is recommending lessees consider analyzing the RPs in Table 3.5.4-7 to further reduce potential coastal habitat and fauna impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.5.4-7. Recommended Practices for coastal habitat and fauna impacts and related benefits

Recommended Practice	Potential Benefit
MUL-5: Use equipment, technology, and best practices to produce the least amount of noise possible to reduce noise impacts.	Minimizing the amount of noise from onshore activities may reduce disturbance and displacement of some coastal fauna species.
MUL-12: Incorporate ecological design elements where practicable. Examples include nature-inclusive design products as an alternative to traditional concrete, which could enhance and encourage the growth of marine flora and fauna (e.g. oyster beds or other artificial reefs).	Ecological design elements could reduce the amount or type of land disturbance.
MUL-18: Coordinate transmission infrastructure among projects by using shared intra- and interregional connections, meshed infrastructure, or parallel routing.	Fewer landfalls and a reduction of onshore cables may reduce land disturbance, noise, and traffic impacts on coastal habitat and fauna because there may be less disturbance of beach, dune, and onshore habitats.
MUL-21: Use best available technology, including new and emerging technology, when possible and consider upgrading/retrofitting equipment.	Using best available technology for onshore construction methods may result in lower noise from onshore activities that could disturb and displace some coastal fauna species and decrease overall impacts on coastal habitats and fauna.
MUL-23: Avoid or reduce potential impacts on important environmental resources by adjusting project design.	The use of HDD for cable installation could help to avoid and minimize impacts on benthic habitats and difficult-to-replace resources by minimizing the amount of land disturbance compared to cable installation methods that use trenching. Adjustments by developers could also include siting onshore cables and substations in developed ROWs, thereby avoiding undisturbed habitat.
MUL-26: Coordinate regional monitoring and survey efforts to standardize approaches, understand potential impacts to resources at a regional scale, and maximize efficiencies in monitoring and survey efforts. Develop monitoring and survey plans that meet regional data requirements and standards.	Coordinating regional monitoring and survey efforts would maximize the monitoring efficiency. The data gathered would be evaluated and considered for future mitigation and monitoring needs, which will serve to reduce impacts.

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3.5 Biological Resources

3.5.7 Sea Turtles

This section discusses potential impacts on sea turtles from the Proposed Action, alternatives, and ongoing and planned activities in the sea turtle geographic analysis area. The geographic analysis area for sea turtles, as shown on Figure 3.5.7-1, includes the U.S. Northeast Continental Shelf and Southeast Continental Shelf LMEs to capture the movement range of sea turtles. Due to the size of the geographic analysis area, for analysis purposes in this PEIS, the focus is on sea turtle species likely to occur in the NY Bight area and be affected by NY Bight project activities.

The sea turtles impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

3.5.7.1 Description of the Affected Environment and Future Baseline Conditions

Five species of sea turtles have been documented in U.S. waters of the northwest Atlantic Ocean in the vicinity of the NY Bight area: green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and loggerhead (*Caretta caretta*). All five species are listed under the ESA; hawksbill, Kemp's ridley, and leatherback sea turtles are listed as endangered, and green and loggerhead sea turtles are listed as threatened. Critical habitat has been designated for green, hawksbill, leatherback, and loggerhead sea turtles but is not within or in the vicinity of the NY Bight area. Although hawksbill sea turtles have been documented in OCS waters of the northwest Atlantic Ocean, they are rare in this region and have not been documented within New Jersey or New York waters within the last 10 years (Conserve Wildlife Foundation of New Jersey 2022; NMFS 2022a). Therefore, hawksbill sea turtles are considered unlikely to occur within the NY Bight area and thus will not be evaluated further in this PEIS. Three of the four species expected to occur in the NY Bight area are broken out into DPSs, which include the North Atlantic DPS of green sea turtles, the leatherback sea turtle Northwest Atlantic subpopulation, and the Northwest Atlantic DPS of loggerhead sea turtles. A DPS has not been designated for leatherback sea turtles because this species is listed as endangered throughout its global range (85 Fed. Reg. 48332).

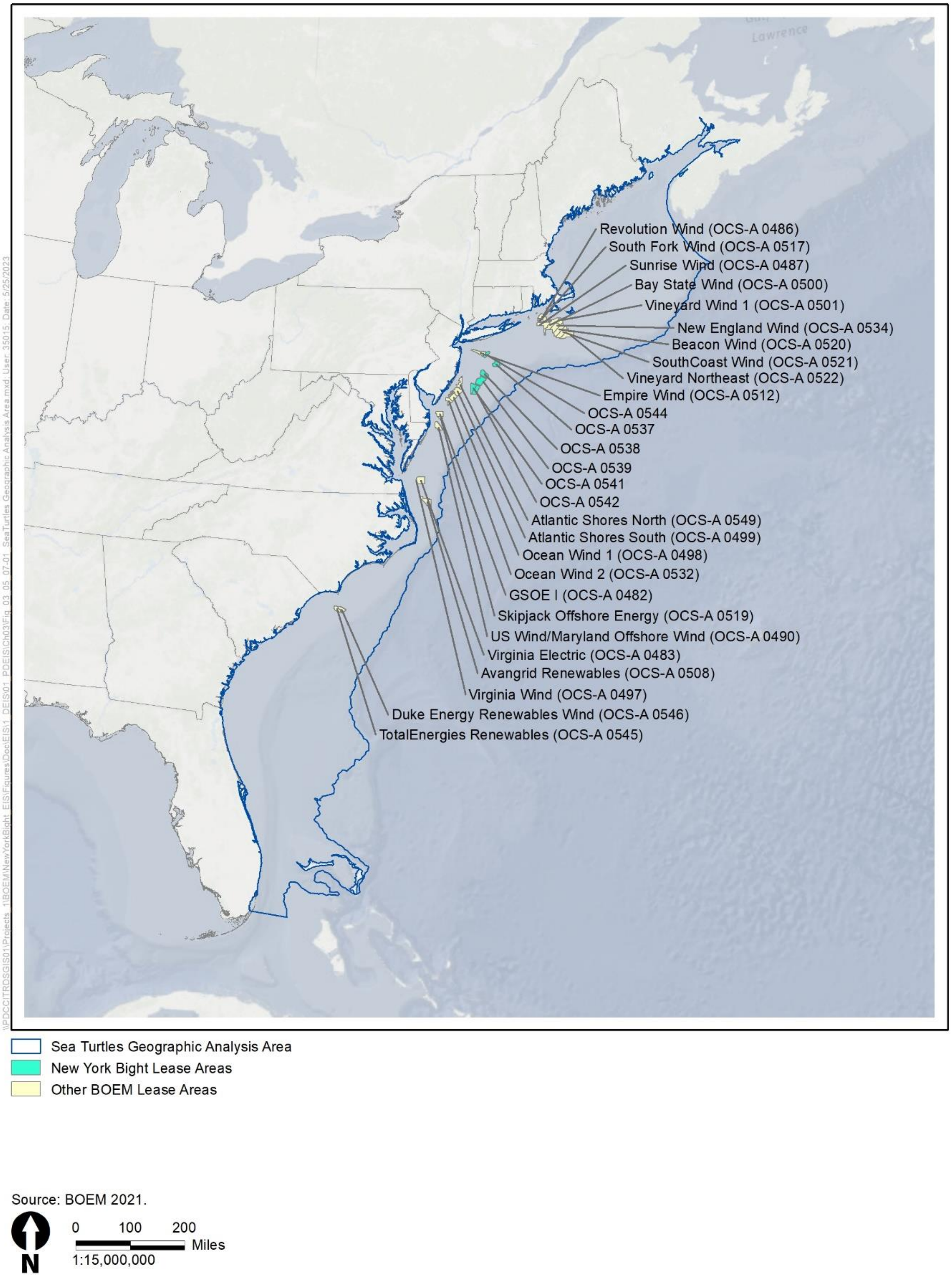


Figure 3.5.7-1. Sea turtles geographic analysis area

Sea turtles generally migrate into or through the NY Bight area as they travel between their northern-latitude feeding grounds and their nesting grounds in the southern United States, Gulf of Mexico, and Caribbean. As ocean waters warm in the spring, sea turtles migrate northward to their feeding grounds in the Mid-Atlantic, typically arriving in the spring or summer and remaining through the fall. As water temperatures cool, most sea turtles begin their return migration to the south. Historically, this southward migration begins in October, and most turtles are gone by the first week in November. Based on this seasonal migration pattern, sea turtles are generally expected to occur in the NY Bight area between late spring and fall (NMFS 2021a). Some individuals may remain in the Mid-Atlantic into the winter when they could experience cold stunning as temperatures drop below 50°F (10°C) (NMFS 2021b), but occurrence is less likely when water temperatures are low (i.e., winter and spring) (BOEM 2012; Greene et al. 2010).

The best available information on the occurrence and distribution of sea turtles in the NY Bight area is provided by a combination of sighting data, technical reports, and academic publications, including:

- Aerial and shipboard survey data collected by the Northwest Atlantic Marine Ecoregional Assessment (Greene et al. 2010);
- Aerial data collected by the NYSERDA (Normandeau Associates Inc. and APEM Inc. 2021a, 2021b);
- PSO monitoring data collected during survey activities for offshore wind projects within or adjacent to the NY Bight area (Gardline 2018, 2021, 2022; RPS 2019, 2020; Smultea 2020);
- Sighting data retrieved from the Ocean Biodiversity Information System (OBIS 2022); and
- Data from the AMAPPS (Palka et al. 2021; NMFS 2021a; NMFS 2022a; NMFS 2022b).

Species occurrence is summarized in Table 3.5.7-1 and described in the following paragraphs. Seasonal density estimates derived from NYSERDA annual reports for their offshore project area (Normandeau Associates Inc. and APEM Inc. 2021a,b) are provided in Table 3.5.7-2. Population estimates are not provided in this section for individual species as sea turtles are wide-ranging and long-lived, making population estimates difficult. Also, survey methods vary depending on species (NMFS and USFWS 2015).

Table 3.5.7-1. Sea turtles likely to occur in the NY Bight area

Common Name	Scientific Name	Distinct Population Segment/ Population[1]	ESA Status	Relative Occurrence in the NY Bight area[2]	Seasonal Occurrence in the NY Bight area
Green sea turtle	*Chelonia mydas*	North Atlantic	Threatened	Regular	Summer through Fall
Kemp's ridley sea turtle	*Lepidochelys kempii*	--	Endangered	Common	Late Spring through Fall
Leatherback sea turtle	*Dermochelys coriacea*	Northwest Atlantic (subpopulation)	Endangered	Common	Late Spring through Fall
Loggerhead sea turtle	*Caretta caretta*	Northwest Atlantic	Threatened	Common	Late Spring through Fall

[1] NMFS 2021a. As a note, the leatherback sea turtle does not have designated Distinct Population Segment because the population is listed as endangered throughout its global range (85 Fed. Reg. 48332).
[2] Regular = occurring in low to moderate numbers on a regular basis or seasonally; Common = occurring consistently in moderate to large numbers.

Table 3.5.7-2. Seasonal sea turtle density estimates in the New York offshore project area[1] derived from NYSERDA annual reports

Species	Density (animals/100 square kilometers)[2]			
	Spring	Summer	Fall	Winter
Green sea turtle	0.0000	0.0003	0.0000	0.0000
Kemp's ridley sea turtle	0.0003	0.0057	0.0016	0.0000
Leatherback sea turtle	0.0000	0.0010	0.0006	0.0000
Loggerhead sea turtle	0.0010	0.1079	0.0016	0.0003

Source: Normandeau Associates Inc. and APEM Inc. 2021b.
[1] The New York offshore project area encompasses the waters of the NY Bight from Long Island southeast to the continental shelf break.
[2] Density estimates are derived from the final NYSERDA report for all surveys between Summer 2016 and Spring 2019 in the New York offshore project area using the most recent year for which data were available for each season or species for which identification was confirmed.

Green sea turtle: Green sea turtles found in the NY Bight area belong to the North Atlantic DPS. This species inhabits tropical and subtropical waters around the globe. In the United States, green sea turtles occur from Texas to Maine, as well as the Caribbean. Late juveniles and adults are typically found in nearshore waters of shallow coastal habitats (NMFS 2022b). In the pelagic environment, green sea turtles are often found in convergence zones (NMFS and USFWS 1991).

No green sea turtle nesting events have been documented on the New Jersey or New York coasts in the NY Bight area. Their diet is largely herbivorous, composed primarily of algae and seagrasses with occasional sponges and invertebrates (NMFS 2022b). Green sea turtles primarily occur offshore within the NY Bight area in summer and fall (Table 3.5.7-2; NMFS 2022b). During the NYSERDA aerial surveys in the New York OPA, only one green sea turtle was observed during the 2016 summer survey (Normandeau Associates Inc. and APEM Inc. 2021b), and results of the AMAPPS visual survey data from 2010 to 2017 indicate green sea turtles are only present in the NY Bight area in the summer and fall (Palka et al. 2017). Data from the sea turtle stranding and salvage network show 73 strandings of green sea turtles in New Jersey and 150 strandings of sea turtles in New York between 2012 and November

2022, largely the result of cold stunning and traditional stranding reasons. Traditional stranding, as defined, occurs when a dead, sick, or injured sea turtle is found washed ashore, floating, or underwater, and when it is not an incidental capture, a post-hatchling, or a cold-stunning event. It specifically excludes healthy, uninjured sea turtles. Out of the recorded strandings, 10 were marked as incidental capture (NMFS 2022a).

PSO monitoring data showed one green sea turtle observed in the Ocean Wind 2 lease area (OCS-A 0532) during surveys between May 2021 and May 2022 (Gardline 2022); one green sea turtle observed nearshore Long Beach, New York in the NY Bight area during surveys between April 2019 and July 2019 (RPS 2019); one green sea turtle observed in the Atlantic Shores South lease area (OCS-A 0499) during surveys from May 2020 to October 2020 (RPS 2020); and two green sea turtles observed offshore Long Island, New York near Montauk during surveys between September 2019 and September 2020 (Smultea Environmental Sciences 2020). There is no population estimate for the North Atlantic DPS of green sea turtles, but the nester abundance for this DPS is estimated to be 167,424, (Seminoff et al. 2015). All major nesting populations in the North Atlantic DPS have shown long-term increases in abundance, but data are lacking to evaluate trends for the South Atlantic DPS (Seminoff et al. 2015).

Kemp's ridley sea turtle: All Kemp's ridley sea turtles, including those found in the NY Bight area, belong to a single population. This species primarily inhabits the Gulf of Mexico, although large juveniles and adults travel along the U.S. Atlantic coast. At these life stages, Kemp's ridley sea turtles occupy nearshore habitats in subtropical to warm temperate waters, including sounds, bays, estuaries, tidal passes, shipping channels, and beachfront waters.

A single Kemp's ridley nest was documented on Queens County's West Beach, New York, in 2018 (Yun 2018). However, this nest was outside the primary nesting range for the species, which is essentially limited to the beaches of the western Gulf of Mexico (NMFS and USFWS 2015). The diet of Kemp's ridley sea turtles is composed primarily of crabs (NMFS 2022c). Kemp's ridley sea turtles primarily occur in the NY Bight area during the spring, summer, and fall (Table 3.5.7-2; NMFS 2022c). Results of the NYSERDA aerial surveys show a total of 64 Kemp's ridley sea turtles were observed in the New York OPA between 2016 and 2018, most of which (57 observations) occurred during the summer surveys (Normandeau Associates Inc. and APEM Inc. 2021b). AMAPPS survey results show similar distributions with a few individuals observed around the NY Bight area in spring which increases in the summer and begins to decrease again in the fall (Palka et al. 2021). Additionally, aerial surveys conducted for the New York Bight Whale Monitoring Program show one observation of Kemp's ridley sea turtles during the summer of 2018 (Tetra Tech and LGL 2020). However, it is noted that visual sighting data may be limited because this small species is difficult to observe using typical aerial survey methods (Kraus et al. 2016). Stranding data from 2012 to 2022 show 102 Kemp's ridley sea turtle strandings in New Jersey and 285 in New York, primarily due to cold stunning or traditional stranding causes (dead, sick, or injured sea turtle), but 51 of these strandings were marked as incidental capture (NMFS 2022a). PSO monitoring data show only one confirmed observation of Kemp's ridley sea turtles in the Ørsted Lease Areas OCS-A 0486, 0487, and 0500 (Smultea Environmental Sciences 2020), which are outside of the NY Bight area. In 2012, the population of individuals aged two and up was estimated at

248,307 turtles (Gallaway et al. 2013). Since 2009, there has been a decline in nest abundance for this population (NMFS and USFWS 2015).

Leatherback sea turtle: Leatherback sea turtles that occur in the NY Bight area belong to the Northwest Atlantic population identified in the 2020 status review for the species (NMFS and USFWS 2020). However, this population has not been identified as a DPS or listed separately under the ESA at this time because the species is considered endangered throughout its global range. This species is found in the Atlantic, Pacific, and Indian Oceans (NMFS 2022d). Leatherback sea turtles can be found throughout the western North Atlantic Ocean as far north as Nova Scotia, Newfoundland, and Labrador. While early life stages prefer oceanic waters, adult leatherback sea turtles are generally found in mid-ocean, continental shelf, and nearshore waters (NMFS and USFWS 1992). Leatherback sea turtle diets are composed primarily of jellyfish and other gelatinous prey, but they may also incidentally consume sea urchins, squid, crustaceans, fish, and vegetation (Eckert et al. 2012). Leatherback sea turtles are known to dive deeper than other sea turtle species while feeding and are therefore more tolerant of cooler oceanic temperatures. Additionally, Bailey et al. (2012) found that mesoscale eddies, convergence zones, and areas of upwelling attract foraging leatherbacks due to the aggregation of jellyfish, their preferred prey, within these features.

There have not been any documented nesting events along the New Jersey or New York coasts within the NY Bight area. Leatherback sea turtles in the NY Bight area primarily occur in the late spring through fall (Table 3.5.7-2; BOEM 2012; Geo-Marine 2010; Palka et al. 2021). During aerial and shipboard surveys for marine mammals and sea turtles off the coast of New Jersey in 2008 and 2009, 12 leatherback sea turtles were sighted during the summer in waters ranging from 59 to 98 feet (18 to 30 meters) deep, located 6.2 to 22.3 miles (10 to 36 kilometers) from shore (Geo-Marine 2010). Leatherback sea turtles were observed 47 times within the New York OPA, which encompasses the waters of the NY Bight from Long Island southeast to the continental shelf break, during the NYSERDA surveys, predominantly in the fall (30 sightings) followed by summer (17 sightings) with no observations in the spring or winter (Normandeau Associates Inc. and APEM Inc. 2021b). AMAPPS and the New York Bight Whale Monitoring Program sightings show a similar trend with higher observations of leatherback sea turtles in the NY Bight area in summer and fall, a few in spring, and none in winter (Tetra Tech and LGL 2020; Palka et al. 2021). Stranding data reported 42 stranded leatherbacks in New Jersey and 109 in New York between 2012 and 2022, primarily due to traditional stranding causes (dead, sick, or injured sea turtle), but 23 of these strandings were marked as incidental capture (NMFS 2022a). PSO monitoring data show one observation of a leatherback sea turtle offshore Block Island, Rhode Island (which is outside the NY Bight area) during surveys between September 2020 and September 2021 (Gardline 2021); 40 leatherbacks observed along the New Jersey coast during surveys between May 2021 and May 2022 (Gardline 2022); 25 leatherback sea turtles observed along the New Jersey coast during surveys between May 2020 to October 2020 (RPS 2020); and 14 leatherback sea turtles observed between the eastern extent of Long Island, New York and Rhode Island during surveys between September 2019 and September 2020 (Smultea Environmental Sciences 2020). The best available estimate of nesting female abundance for the Northwest Atlantic population is 20,659 females. This population is currently exhibiting an overall decreasing trend in annual nesting activity, likely attributed to the destruction or modification of their nesting habitats due to coastal development or erosion (NMFS and USFWS 2020).

Loggerhead sea turtle: Loggerhead sea turtles found in the NY Bight area belong to the Northwest Atlantic DPS. This species inhabits nearshore and offshore habitats throughout the globe. Loggerhead sea turtles occur throughout the Northwest Atlantic as far north as Newfoundland (NMFS 2022e). Coastal waters of the western Atlantic have been identified as foraging habitat for juveniles (USFWS 2020), and the Mid-Atlantic Bight of the Atlantic OCS is an important seasonal foraging ground for approximately 40,000 to 60,000 juvenile and adult loggerheads during summer months (NEFSC and SEFSC 2011). Juvenile loggerhead sea turtles have omnivorous diets, consuming crabs, mollusks, jellyfish, and vegetation. Adults are carnivores, consuming primarily benthic invertebrates (NMFS 2022e).

A single loggerhead nest was documented at Island Beach State Park, New Jersey, in 1979 (Brandner 1983). This nesting event was outside the primary nesting range for the species, which stretches from Texas to Virginia, so no nesting is likely to occur in the NY Bight area (NMFS and USFWS 2008). Loggerhead sea turtles occur in the NY Bight area throughout the year but are more common in the summer and fall (Table 3.5.7-2; BOEM 2012; Geo-Marine 2010; Tetra Tech and LGL 2020; Palka et al. 2021). During aerial and shipboard surveys for marine mammals and sea turtles off the coast of New Jersey in 2008 and 2009, 69 loggerhead sea turtles were sighted between June and October in waters ranging from 30 to 112 feet (9 to 34 meters) deep, located 0.9 to 23.6 miles (1.5 to 38 kilometers) from shore (Geo-Marine 2010). The mean sea surface temperature associated with loggerhead sea turtle sightings was 65.3 degrees Fahrenheit (18.5 degree Celsius). Loggerheads were the most common reported species during NYSERDA aerial surveys in the New York OPA, which reported 1,397 observations (Normandeau Associates Inc. and APEM Inc. 2021b). Most of these sightings were in the summer (1,377) followed by the fall (11), spring (8), and winter (1) (Normandeau Associates Inc. and APEM Inc. 2021b). AMAPPS survey data show loggerheads are most common in the NY Bight area in the summer and fall, with scattered sightings possible further offshore in the spring and winter (Palka et al. 2021). NMFS (2022) reported 397 strandings of loggerhead sea turtles in New Jersey and 339 in New York primarily due to traditional stranding reasons (dead, sick, or injured sea turtle) and cold stunning, but 16 of these were marked as incidental capture. PSO monitoring data show 14 observations of loggerhead turtles along the New Jersey coast during surveys between May 2021 and May 2022 (Gardline 2022); 35 sightings along the New Jersey coast during surveys between May 2020 to October 2020 (RPS 2020); and 14 sightings between the eastern extent of Long Island, New York and Rhode Island during surveys between September 2019 and September 2020 (Smultea Environmental Sciences 2020). The most recent population estimate for the northwest Atlantic continental shelf, calculated in 2010, is 588,000 juvenile and adult loggerhead sea turtles (NEFSC and SEFSC 2011). The Northern recovery unit for the Northwest Atlantic DPS, which is the only recovery unit likely to occur in the NY Bight area, is below the recovery criteria for the number of nests, which required a 2 percent annual increase in the number of nests over a generation time of 50 years; however, the number of nests does correspond to the number of nesting females, which meets the requirement for that recovery criteria (Bolten et al. 2019). All other recovery criteria for this recovery unit—such as abundance on foraging grounds, trends in strandings, and threats to species habitat — have either not been accomplished or there are insufficient data to assess potential recovery (Bolten et al. 2019).

All four sea turtle species likely to occur in the geographic analysis area are subject to regional, ongoing threats. These threats include fisheries bycatch, loss or degradation of nesting and foraging habitat, entanglement in fishing gear, vessel strikes, predation and harvest, disease, and climate change. Green, Kemp's ridley, and loggerhead sea turtles are also susceptible to cold stunning.

3.5.7.1.1 Importance of Sound to Sea Turtles

There are few studies reporting sound production in sea turtles, despite their ability to hear sounds in both air and water. While the general importance of sound to the ecology of sea turtles is not well understood, there is a growing body of knowledge suggesting that sea turtles may use sound in a multitude of ways. Cook and Forest (2005) found that nesting leatherback sea turtles produce sound when breathing in air, but this work suggested the sound was a byproduct of labored breaking rather than a communication signal. Sea turtle embryos and hatchlings have been reported to make airborne sounds, thought to be produced for synchronizing hatching and nest emergence (Montiero et al. 2019, Ferrara et al. 2019, Ferrara et al. 2014a and 2014b, and McKenna et al. 2019). Charrier et al. (2022) noted the production of 10 different underwater sounds in juvenile green sea turtles including those within and above the frequency range of hearing reported for this species. A more comprehensive understanding of sound production, and hearing is needed in sea turtles. However, the limited but growing information available suggests sound may be important to these animals.

Hearing Anatomy of Sea Turtles

The outermost part of the sea turtle ear, or tympanum, is covered by a thick layer of skin covering a fatty layer that conducts sound in water to the middle and inner ear. This is a distinguishing feature from terrestrial and semi-aquatic turtles. This thick outer layer makes it difficult for turtles to hear well in air but it facilitates the transfer of sound from the aqueous environment into the ear (Ketten et al. 1999). The middle ear has two components that are encased by bone, the columella and extracolumella, which provides the pathway for sound from the tympanum on the surface of the turtle head to the inner ear. The middle ear is also connected to the throat by the Eustachian tube. The inner ear consists of the cochlea and basilar membrane. Because there is air in the middle ear, it is generally believed that sea turtles detect sound pressure rather than particle motion. Sea turtle ears are described as being similar to a reptilian ear, but due to the historically limited data in sea turtles and reptiles, fish hearing is often used as an analog when considering potential impacts of underwater sound.

Hearing in sea turtles has been measured through electrophysiological and behavioral studies both in air and in water on a limited number of life stages for each of the five species. In general, sea turtles hear best in water between 200 to 750 Hz and do not hear well above 1 kHz. It is worth noting that there are species-specific and life-stage specific differences in sea turtle hearing (Table 3.5.7-3). Sea turtles are also generally less sensitive to sound than marine mammals, with the most sensitive hearing thresholds underwater measured at or above 75 dB re 1 µPa (Reese et al. 2023; Papale et al. 2020). Loggerhead sea turtles have been studied most thoroughly with respect to other species, including post-hatchlings

(Lavender et al. 2012, 2014), juveniles (Bartol et al. 1999; Lavender et al. 2012, 2014), and adults (Martin et al. 2012).

Table 3.5.7-3. Hearing capabilities, including hearing frequency range and peak sensitivity in sea turtles, by species

Species	Life Stages Tested	Hearing Frequency Range (Hz)	Maximum Sensitivity (Hz)	References
Loggerhead	Post-hatchling, juvenile	100–900 (in air)	500–700	Ketten & Bartol 2006
	Post-hatchling, juvenile, adult	50–1,100 (underwater)	100–400	Bartol & Bartol 2012, Lavender et al. 2014, Martin et al. 2012, Lenhardt 2002, Bartol et al. 1999
Green	Juvenile, sub-adult	50–2,000 (in air)	200–700	Ridgway et al. 1969; Ketten & Bartol 2006; Piniak et al. 2016
	Juvenile	50–1,600 (underwater)	200–400	Piniak et al. 2016
Leatherback	Hatchling	50–1,600 (in air)	300	Piniak 2012, Piniak et al. 2012
	Hatchling	50–1,200 (underwater)	300	Piniak 2012, Piniak et al. 2012
Kemps ridley	Juvenile	100–500 (in air)	100–200	Ketten & Bartol 2006

Source: Summarized from Table 3 in Reese et al. 2023, which was adapted from Papale et al. 2020.
Note: hearing frequency range indicates the widest range of hearing based on the aggregation of results from the references listed, while max sensitivity represents the range of sounds that they can hear best.

Potential Impacts of Underwater Sound

As with marine mammals, sea turtles may experience a range of impacts from underwater sound including non-auditory injury, PTS or TTS, behavioral changes, acoustic masking, or increases in physiological stress. The potential impacts will depend on the physical qualities of the sound source and the environment, as well as the physiological characteristics and the behavioral context of the species of interest. Sound from activities such as pile-driving, seismic surveys, and drilling could have impacts on sea turtles given the overlap between sea turtles' hearing range and the frequency range of these sound sources - yet there is extremely limited data on how their behavior and physiology are impacted. A comprehensive review of the potential impacts of noise on sea turtles can be found in Reese et al. 2023.

While there is no direct evidence of PTS occurring in sea turtles, evidence of underwater noise-induced TTSs in a freshwater turtle species recently have been recorded and suggest turtles may be more sensitive to sound than previously understood (Salas et al. 2023; Mannes et al. 2023). In red eared sliders, Salas et al. (2023) reported the mean predicted TTS onset was 160 dB re 1 μPa^2 s. There was individual variation in susceptibility to TTS, threshold shift magnitude, and recovery rate, which was non-monotonic and occurred on time scales ranging from less than 1 hour to more than 2 days post-exposure (Salas et al. 2023). TTS also has been demonstrated in red eared sliders based on a 24-hour exposure that resulted in a sound exposure level of 160 dB re 1 μPa^2 s, where all animals showed a depression in sensitivity immediately after exposure and a full recovery 3–5 hours after exposure (Mannes et al. 2023). Prolonged or repeated exposure to sound levels sufficient to induce TTS without recovery time can lead to PTS in marine mammals (Southall et al. 2007). Few studies have looked at hair cell damage in reptiles, and do not indicate precisely if sea turtles are able to regenerate injured sensory hair cells (Warchol 2011). While several studies have examined physiological responses of sea turtles to physically stressful events (e.g., incidental or directed capture in fishing nets, cold stunning, handling, transport, etc.), to date, no research has been published on potential stress responses in sea turtles to elevated environmental noise (Reese et al. 2023). Stress response studies characterizing physiological (stress/hormone) responses to sound are ongoing to estimate potential acoustic impacts on sea turtles from industry sound sources. Elevated levels of corticosterone have been observed in Kemp's ridley sea turtles and green sea turtles in response to stressful stimuli such as ground transport for rehabilitation and disease (Aguirre et al. 1995; Hunt et al. 2016). Other physiological impacts due to chronic stress include immunosuppression (Milton and Lutz 2003). Samuel et al. (2005) demonstrated that anthropogenic sound levels from boating and recreational activity near Long Island, New York were over two orders of magnitude greater than when compared with the periods of lowest human activity, and suggested exposure to such levels could affect sea turtle behavior. Chronic exposure to anthropogenic noise may result in increased stress responses in sea turtles, which could have direct consequences on individual fitness (Reese et al. 2023).

The soundscapes and subsequent noise impacts presently experienced by sea turtles in biologically important habitats, and their behavioral and physiological responses may be variable and in general are still not well understood.

Regulation of Underwater Sound for Sea Turtles

There are few empirical data available to form regulatory thresholds for sea turtle sound exposure. For several years, the regulatory community accepted the recommendations of Popper et al. (2014) and used their thresholds for fishes without swim bladders as a proxy for sea turtles. NMFS has adopted the U.S. Navy PTS and TTS thresholds from Finneran et al. (2017) as their own (NMFS 2023). These thresholds include dual criteria (Lpk and SEL) for PTS and TTS, along with auditory weighting functions published by Finneran et al. (2017) used in conjunction with SEL thresholds for PTS and TTS. The behavioral threshold recommended in the GARFO acoustic tool (2020) is an SPL of 175 dB re 1 µPa (Finneran et al. 2017; McCauley et al. 2000) (Table 3.5.7-4). These thresholds apply to all life stages.

Table 3.5.7-4. Acoustic thresholds for sea turtles currently used by NMFS GARFO and BOEM for auditory effects from impulsive and non-impulsive signals, as well as thresholds for behavioral disturbance

Impulsive Signals				Non-impulsive Signals		All
PTS		TTS		PTS	TTS	Behavior
Lp,pk	LE, 24hr	Lp,pk	LE, 24hr	LE, 24hr		Lp,rms
232	204	226	189	220	200	175

Lp,pk = peak sound pressure (dB re 1 µPa); LE =sound exposure level accumulated over 24 hours (dB re 1 µPa2s); Lp =root-mean-square sound pressure (dB re 1 µPa).
PTS = permanent threshold shift; TTS = temporary threshold shift, which is a recoverable hearing effect.
Sources: Finneran et al. 2017; McCauley et al. 2000.

Thresholds for Auditory Injury

As a conservative approach, Popper et al. (2014) recommended using thresholds developed for fishes without swim bladders for sea turtles in response to impulsive sounds. Finneran et al. (2017) agree, that while still unsatisfactory, data from fish provide a better analogy currently due to similar hearing range and that the functioning basilar papilla in the turtle ear is dissimilar to the functioning cochlea in mammals. When exposed to acoustic signals representative of low- and mid-frequency active sonar, Halvorsen et al. (2013); Halvorsen et al. (2012), reported TTS in some species of fish exposed to cumulative SELs of approximately 220 dB re 1 µPa2s between 2 and 3 kHz, and 210 to 215 dB re 1 µPa2s between 170 and 320 Hz, respectively (Finneran et al. 2017). Based on these data the U.S. Navy uses an estimated SEL of 200 dB re 1 µPa2s for TTS onset in sea turtles. An 11 dB difference, on average, was found between SEL-based impulsive and non-impulsive TTS thresholds for marine mammals. By applying the same rule to turtles, (Finneran et al. 2017) derived a weighted SEL-based impulsive TTS threshold of 189 dB re 1 µPa2s which is 3 dB higher than the previously recommended unweighted threshold by Popper et al. (2014) of 186 dB re 1 µPa2s (Finneran et al. 2017). Based on the relatively high SEL-based TTS threshold derived for sea turtles, Finneran et al. (2017) hypothesized that the Lpk based threshold for sea turtles would be higher than that for marine mammals. Consequently, the sea turtle Lpk based TTS threshold for impulsive noise is set to 226 dB re 1 µPa, to match the highest marine mammal value. Sea turtle PTS data from impulsive noise exposures do not exist, therefore PTS onset was estimated by adding 15 dB to the derived SEL-based TTS thresholds and adding 6 dB to the Lpk thresholds (Finneran et al. 2017; Southall et al. 2007). The SEL-based non-impulsive PTS threshold is set to 220 dB re 1 µPa2s in sea turtles (Finneran et al. 2017).

Thresholds for Behavioral Disturbance

There are limited data pertaining to behavioral responses of sea turtles to anthropogenic noise, and none specifically to sounds generated by offshore wind activities. Several publications have attempted to examine sea turtles' immediate behavioral responses mostly focusing on seismic airgun noise. McCauley et al. (2000) observed that one green turtle and one loggerhead sea turtle in an open water pen increased swimming behaviors in response to a single seismic airgun at received levels of 166 dB re 1 µPa and exhibited erratic behavior at received levels greater than 175 dB re 1 µPa. Other empirical work has shown a range of responses, but NMFS developed sea turtle behavioral criteria based on these studies by McCauley et al. (2000). The sound level at which sea turtles are expected to exhibit a behavioral response to both impulsive and non-impulsive sound is a received SPL of 175 dB re 1 µPa.

Thresholds for Non-Auditory Injury

For both turtles and mammals, NMFS has adopted criteria used by the U.S. Navy to assess the potential for non-auditory injury from underwater explosive sources as presented in Finneran et al. (2017). The criteria include thresholds for the following non-auditory effects: mortality, lung injury, and gastrointestinal injury. Unlike auditory thresholds, these depend upon an animal's mass and depth.

The U.S. Navy has published two sets of equations for these thresholds. The first set of equations (Table 3.5.6-6) is usually intended for estimating numbers of animals that may be affected, while the second set of equations (Table 3.5.6-7) is more conservative and normally used for defining mitigation zones. The approach requires choosing a set of representative animal masses to assess.

3.5.7.2 Impact Level Definitions for Sea Turtles

Definitions of potential impact levels are provided in Table 3.5.7-5. Beneficial impacts on sea turtles are described using the definitions described in Section 3.3.2 (see Table 3.3-1).

Table 3.5.7-5. Definitions of potential adverse impact levels for sea turtles

Impact Level	Definition
Negligible	There would be no measurable impacts on individuals or populations of sea turtles, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Impacts on sea turtles are detectable and measurable, but are low intensity, highly localized, and temporary or short term in duration. Impacts would not result in population-level effects.
Moderate	Impacts on sea turtles are detectable and measurable. These impacts could result in loss of individuals, but those effects would likely be recoverable and would not affect population viability.
Major	Impacts on sea turtles are significant and extensive, long term in duration, and could have population-level effects that are not recoverable, even with mitigation.

Contributing IPFs to impacts on sea turtles include accidental releases, cable emplacement and maintenance, discharges/intakes, electric and magnetic fields and cable heat, survey gear utilization, noise, port utilization, presence of structures, and vessel traffic. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.5.7-6.

Table 3.5.7-6. Issues and indicators to assess impacts on sea turtles

Issue	Impact Indicator
Underwater noise from construction, operation, and conceptual decommissioning	Extent, frequency, and duration of impacts resulting from noise above established effects thresholds as noted in Section 2.5 (Tables 3–4) in the Construction and Operations Plan Modeling Guidelines.[1]
Vessel collisions	Qualitative estimate of potential collision risk.
Water quality impacts	Quantitative estimate of intensity and duration of suspended sediment effects. Qualitative analysis of impacts from potential discharges (fuel spills, trash, and debris) relative to baseline.
Artificial light	Intensity, frequency, and duration of impacts relative to baseline.
Power transmission	Theoretical extent of detectable electric and magnetic field effects.
Seabed and water column disturbance/alteration	Water column volume and acres of seabed disturbance, loss, or conversion by structure presence.
Habitat alteration	Acres of land disturbance (e.g., nesting habitat), loss, or conversion due to onshore construction or cable landfall.
Prey impacts	Extent, frequency, and duration of impacts resulting from activities associated with offshore wind development on prey species for sea turtles.
Entanglement risk from gear/wind equipment	Qualitative estimate of potential entanglement risk.

[1] Source: https://www.boem.gov/renewable-energy/boemoffshorewindpiledrivingsoundmodelingguidance.

3.5.7.3 Impacts of Alternative A – No Action – Sea Turtles

When analyzing the impacts of the No Action Alternative on sea turtles, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for sea turtles. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with the other planned non-offshore-wind and offshore wind activities, which are described in Appendix D, *Planned Activities Scenario*.

3.5.7.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for sea turtles described in Section 3.5.7.1, *Description of the Affected Environment and Future Baseline Conditions,* would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore-wind and offshore wind activities. Ongoing non-offshore-wind activities in the geographic analysis area that contribute to impacts on sea turtles include undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); ongoing vessel traffic; installation of new structures on the U.S. Continental Shelf; onshore development activities; and global climate change (see Appendix D for a description of ongoing activities). These activities contribute to numerous IPFs including:

- Accidental releases, which can have physiological effects on sea turtles;
- Discharges/intakes, which can result in altered micro-climates of warm water surrounding outfalls and entrainment risk;
- Cable emplacement and maintenance and port utilization, which can disturb benthic habitats, affect water quality, and present an entrainment risk for sea turtles;
- EMFs and heat, which can result in behavioral changes in sea turtles;
- Underwater noise, which can have physiological and behavioral effects on sea turtles;
- Port utilization, which can disturb benthic habitats, affect water quality, and present an entrainment risk for sea turtles during dredging and could introduce additional noise;
- The presence of structures, which can result in behavioral changes in sea turtles and effects on prey species, which can affect prey availability for, and distribution of, sea turtles, and increased risk of interactions with fishing gear;
- Vessel traffic, which increases risk of vessel collision;
- Survey gear utilization, which can result in interactions of gear with sea turtles; and
- Lighting, which has a limited potential to attract sea turtles offshore and to result in disorientation of nesting females and hatchling turtles from artificial lighting on nesting beaches or in nearshore habitats.

Because sea turtles have large ranges and highly migratory behaviors, these IPFs can have impacts on individuals over broad geographical scales. Therefore, in addition to the current conditions and trend of sea turtles in the geographic analysis area, these populations are also affected by factors beyond the geographic analysis area. However, the assessment in this PEIS focuses on those stressors currently present within the geographic analysis area; any effect on the populations outside this region are considered as part of the species' ongoing vulnerability, which affects its risk of impact.

The main known contributors to mortality events include collisions with vessels (ship strikes), entanglement with fishing gear, and fisheries bycatch. Many sea turtle migrations can cover long distances within the geographic analysis area, and these factors can have impacts on individuals over broad geographic and temporal scales.

Global climate change is an ongoing potential risk to sea turtles, although the associated impact mechanisms are complex, not fully understood, and difficult to predict with certainty. Possible impacts on sea turtles due to climate change include increased storm severity and frequency; increased erosion and sediment deposition; increased disease frequency; ocean acidification; and altered habitat, prey availability, ecology, and migration patterns. Over time, climate change, in combination with coastal development, would alter existing habitats and render some areas unsuitable for some species and more suitable for others. Available data also suggests that changing temperatures and sea level rise may lead to changes in the sex ratio of sea turtle populations (e.g., green sea turtle population feminization predicted under IPCC scenarios by 2120), loss of nesting area, and a decline in population growth due to nest incubation temperature reaching lethal levels (Patrício et al. 2019; Varela et al. 2019). In addition to affecting nesting activity, increased sea surface temperatures could have physiological effects on sea turtles during migration (Marn et al. 2017). Higher temperatures in migratory corridors would be especially risky for metabolic rates of female sea turtles post-nesting, as they do not generally forage during breeding periods and their body condition would not be expected to be optimal to withstand unexpected changes in water temperature in their migratory habitat (Hays et al. 2014).

Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on sea turtles are listed in Table 3.5.7-7. Ongoing O&M of the Block Island and CVOW-Pilot (OCS-A 0497) projects and ongoing construction of the Vineyard Wind 1 (OCS-A 0501), South Fork Wind (OCS-A 0517), Ocean Wind 1 (OCS-A 0498), Revolution Wind (OCS-A 0486), Sunrise Wind (OCS-A 0487), Empire Wind 1 and 2 (OCS-A 0512), New England Wind Phase 1 and 2 (OCS-A 0534), and CVOW-C (OCS-A 0483) projects would affect sea turtles primarily through the IPFs of noise, presence of structures, and vessel traffic. Ongoing offshore wind activities would have the same type of impacts from these IPFs that are described in detail in Section 3.5.7.3.3, *Cumulative Impacts of the No Action Alternative* for ongoing and planned offshore wind activities, but the impacts would be of lower intensity.

3.5.7.3.2 Impacts of Alternative A – No Action on ESA-Listed Species

As noted in Section 3.5.7.1, *Description of the Affected Environment and Future Baseline Conditions*, all sea turtle species that are expected to occur regularly in the NY Bight area are listed as either threatened or endangered under the ESA. Therefore, the impacts of the No Action Alternative described in Section 3.5.7.3.1 apply to the ESA-listed sea turtle species in the NY Bight area.

3.5.7.3.3 Cumulative Impacts of the No Action Alternative

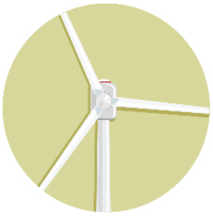
The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects).

Planned non-offshore-wind activities within the geographic analysis area that contribute to impacts on sea turtles include undersea transmission lines, transmission systems (e.g., PBI), gas pipelines, and other submarine cables; tidal energy projects; marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; oil and gas activities; and onshore development activities. BOEM expects planned activities other than offshore wind to affect sea turtles through several primary IPFs, including accidental releases, EMFs, new cable emplacement and maintenance, port utilization, noise, and the presence of structures. See Appendix D for a summary of potential impacts associated with planned non-offshore-wind activities by IPF for sea turtles.

Ongoing and planned offshore wind activities in the geographic analysis area for sea turtles are listed in Table 3.5.7-7.

Table 3.5.7-7. Ongoing and planned offshore wind in the geographic analysis area for sea turtles

Ongoing/Planned	Projects by Region
Ongoing – 12 projects[1] 	**MA/RI** • Block Island (State waters) • Vineyard Wind 1 (OCS-A 0501) • South Fork Wind (OCS-A 0517) • Revolution Wind (OCS-A 0486) • Sunrise Wind (OCS-A 0487) • New England Wind (OCS-A 0534) Phase 1 • New England Wind (OCS-A 0534) Phase 2 **NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512) **VA/NC** • CVOW-Pilot (OCS-A 0497) • CVOW-Commercial (OCS-A 0483)

Ongoing/Planned	Projects by Region
Planned – 18 projects[2] 	**MA/RI** • SouthCoast Wind (OCS-A 0521) • Beacon Wind 1 (OCS-A 0520) • Beacon Wind 2 (OCS-A 0520) • Bay State Wind (OCS-A 0500) • OCS-A 0500 remainder • OCS-A 0487 remainder • Vineyard Wind Northeast (OCS-A 0522) **NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499) **DE/MD** • Skipjack (OCS-A 0519) • US Wind/Maryland Offshore Wind (OCS-A 0490) • GSOE I (OCS-A 0482) • OCS-A 0519 remainder **VA/NC** • Kitty Hawk North (OCS-A 0508) • Kitty Hawk South (OCS-A 0508) **SC** • Duke Energy Renewables Wind (OCS-A 0546) • TotalEnergies Renewables (OCS-A 0545)

CVOW = Coastal Virginia Offshore Wind; DE = Delaware; GSOE = Garden State Offshore Energy; MA = Massachusetts; MD = Maryland; NC = North Carolina; NJ = New Jersey; NY = New York; RI = Rhode Island; SC = South Carolina; VA = Virginia

[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.

[2] Status as of September 20, 2024.

The following sections summarize the potential impacts of ongoing and planned offshore wind activities on sea turtles during construction and installation, O&M, and conceptual decommissioning of the projects by IPF.

Accidental releases: Ongoing and planned offshore wind activities may increase accidental releases of fuels, fluids, hazardous materials, and trash and debris due to increased vessel traffic and installation of WTGs and other offshore structures. The risk of accidental releases is expected to be highest during construction, but accidental releases could also occur during operation and conceptual decommissioning. As described in Section 2.3, *Non-Routine Activities and Events*, accidental releases of chemicals, gases, or man-made debris may occur as a result of a structural failure and could result in impacts on sea turtles.

In the planned activities scenario (see Appendix D, Table D2-3), there would be a low risk of a leak of fuel, fluids, or hazardous materials from any one of approximately 2,525 WTGs and OSS installed in the geographic analysis area, which would store a total of 10,368,997 gallons (39,250,923 liters) of oils and lubricants in the WTG; 7,493,000 gallons (28,364,090 liters) of oils and lubricants in the OSS; 1,437,208 gallons (5,440,424 liters) of diesel fuel in the WTGs; and 1,519,420 gallons (5,751,630 liters) of diesel fuel in the OSS. According to BOEM's modeling (Bejarano et al. 2013), a release of 128,000 gallons

(20,350,374 liters), which represents all available oils and fluids from 130 WTGs and an OSS, is likely to occur no more often than once per 1,000 years, and a release of 2,000 gallons (317,975 liters) or less is likely to occur every 5 to 20 years. The likelihood of a spill occurring from multiple WTGs and OSS at the same time is very low and, therefore, the potential impacts from a spill larger than 2,000 gallons (317,975 liters) are largely discountable. Based on the volumes potentially involved, the additional risk posed by offshore wind development would fall within the range of accidental releases that already occur on an ongoing basis from non-offshore-wind activities.

Impacts resulting from accidental releases may pose a long-term risk to sea turtles and could potentially lead to mortality and sublethal impacts on individuals present in the vicinity of the spill, including adrenal effects, dehydration, hematological effects, increased disease incidence, liver effects, poor body condition, skin effects, skeletomuscular effects, and several other health effects that can be attributed to oil exposure (Camacho et al. 2013; Bembenek-Bailey et al. 2019; Mitchelmore et al. 2017; Shigenaka et al. 2021; Vargo et al. 1986). Additionally, accidental releases may result in impacts on sea turtles due to effects on prey species, although the analysis provided in Appendix D, Table D1-10 suggests localized, temporary effects that would not impact any invertebrate or finfish populations. Oil and fuels from accidental spills may also be transported away from the initial spill site or undergo weathering processes wherein the chemical composition of the oil is altered, which can have unforeseen effects on marine life following a spill (Passow and Overton 2021). However, the potential for exposure would be minor given the isolated nature of these accidental releases when following available regulations such as those set forth by the International Convention for the Prevention of Pollution from Ships (MARPOL) (IMO 2019) and the variable distribution of sea turtles in the geographic analysis area. Fuel spills from vessels have lesser potential impacts on sea turtles due to their low probability of occurrence and relatively limited spatial extent, although impacts of large spills can be significant. Sea turtle exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality (Shigenaka et al. 2021) or sublethal effects on individual fitness.

Trash and debris may be accidentally discharged through fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation; navigation and traffic; survey activities; cables, lines, and pipeline laying; as well as debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low-quantity, localized, and low-impact events from all ongoing and planned non-offshore-wind and offshore wind activities (Appendix D). Direct ingestion of plastic fragments is well documented and has been observed in all species of sea turtles (Bugoni et al. 2001; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). In addition to plastic debris, ingestion of tar, paper, Styrofoam™, wood, reed, feathers, hooks, lines, and net fragments has also been documented (Thomás et al. 2002). Ingestion can also occur when individuals mistake debris for potential prey items (Gregory 2009; Hoarau et al. 2014; Thomás et al. 2002). Potential ingestion of marine debris varies among species and life history stages due to differing feeding strategies (Nelms et al. 2016). Ingestion of plastics and other marine debris can result in both lethal and sublethal impacts on sea turtles, with sublethal effects more difficult to detect (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). Long-term sublethal effects may include dietary dilution, chemical contamination, depressed immune system function, poor body condition, and reduced growth rates, fecundity, and reproductive success. However, these effects are cryptic and clear causal links between ingestion of marine debris and sublethal effects are difficult to identify (Nelms et al. 2016).

Impacts from accidental releases and discharges from ongoing and planned non-offshore-wind activities would likely be minor for sea turtles. Impacts from accidental releases and discharges from offshore wind activities would also be minor as offshore wind projects would be expected to follow all BOEM BMPs and MARPOL guidance for accidental releases. Though long-term consequences to individuals that are detectable and measurable could occur, it would not lead to population-level effects.

Discharges/intakes: Planned offshore wind projects in the geographic analysis area may use HVDC substations that would convert AC to DC before transmission to onshore project components. As described in a BOEM white paper (Middleton and Barnhart 2022), these HVDC systems are cooled by an open loop system that intakes cool sea water and discharges warmer water back into the ocean. Potential effects resulting from intake and discharge use on sea turtles include altered micro-climates of warm water surrounding outfalls, altered hydrodynamics around intakes/discharges, prey entrainment, and sea turtles scavenging intake screens if prey aggregate on them (Wilcox 1985; Martin and Ernest 2000; Villalba-Guerra 2017). Sea turtles may be attracted to the warm water surrounding the outflow area, especially in fall or early winter when the surrounding water temperatures are cooling and the risk for cold-stunning is heightened. However, the warm water discharged is absorbed by the surrounding water and quickly returned to ambient temperatures, thereby minimizing the extent of a warm water plume. Entrainment of potential prey resources would be minimal given the small number of proposed OSSs per project. Entrainment of sea turtles that may depredate on aggregated prey is unlikely due to physical impedance by intake safety screens. Although it is possible for a sea turtle to be impinged and pulled against an intake screen, which could lead to suffocation and drowning, the likelihood of this is considered small given the small number of HVDC converter stations. Sea turtle attraction to warm-water outflows and entrapment by cooling intake systems is documented for nuclear power plants (Wilcox 1985; Martin and Ernest 2000; Villalba-Guerra 2017). However, HVDC converter substation discharges and intakes are expected to be orders of magnitude smaller than those for nuclear power plants. Additionally, the cooling systems for nuclear power plants often use the nearshore ocean water to cool their reactors, which is taken in using a human-made canal from the ocean to the reactor (Martin and Ernest 2000; Villalba-Guerra 2017). The presence of this canal can contribute to the risk of entrainment in nuclear power plant cooling systems, but they would not be present for HVDC converter substations because they are located offshore and would pull directly from surrounding waters. Given this, and the small number of HVDC converter substations planned for the geographic analysis area, impacts on sea turtles are largely discounted. Impacts from intakes and discharges from ongoing and planned offshore wind activities would therefore be long term, low in intensity, localized, and negligible for sea turtles; measurable effects are not anticipated.

Cable emplacement and maintenance: Cable maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances will be localized and generally limited to the emplacement corridor. Data is not available regarding effects of suspended sediments on adult and juvenile sea turtles, although elevated suspended sediments may cause individuals to alter normal movements and behaviors. However, these changes are expected to be too small to be detected

(NOAA 2020). Sea turtles would be expected to swim away from the sediment plume. Elevated turbidity is most likely to affect sea turtles if a plume causes a barrier to normal behaviors, but no impacts would be expected due to swimming through the plume (NOAA 2020). Turbidity associated with increased sedimentation may result in short-term, temporary impacts on some sea turtle prey species such as benthic fish and invertebrates, as well as any SAV present along potential cable routes. The impact on water quality from accidental sediment suspension during cable emplacement is short term and temporary. If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and therefore any impacts would likely be short term and temporary. Turbidity associated with increased sedimentation may result in short-term, temporary impacts on some sea turtle prey species. Long-term changes in benthic habitat due to the presence of hard protection on top of cables may also affect the presence of sea turtle prey species (Janßen et al. 2013; Hutchison et al. 2020), potentially yielding varying effects on sea turtles' foraging abilities around the cables.

Dredging for sand wave clearance may be necessary in places to ensure cable burial below mobile seabed sediments, which could result in additional impacts on sea turtles related to impingement, entrainment, and capture associated with mechanical and hydraulic dredging techniques. Sea turtles have been known to become entrained in trailing suction hopper dredges or trapped beneath the draghead as it moves across the seabed. Direct impacts, especially for entrainment, typically result in severe injury or mortality (Dickerson et al. 2004; NMFS 2020). About 69 dredging projects using trailing suction hopper dredgers have recorded sea turtle takes within channels in New Jersey, Delaware, and Virginia and there have likely been numerous other instances not officially recorded (Ramirez et al. 2017). However, the risk of interactions between hopper dredges and individual sea turtles is expected to be lower in the open ocean areas where dredging may occur compared to nearshore navigational channels where sea turtles are more concentrated in a constrained operating environment (Michel et al. 2013; NMFS 2020). This may be due to the lower density of sea turtles in these areas as well as differences in behavior and other risk factors. Dredging within nearshore areas could affect green sea turtle habitat by directly removing SAV or creating suspended sediments that may be deposited on top of seagrass (see Section 3.5.2, *Benthic Resources*). Changes in turbidity and suspended sediments could temporarily disrupt normal sea turtle behaviors, especially if turtles rely on vision to forage. Sea turtles may experience behavioral effects upon exposure to turbidity or suspended sediments and become more susceptible to other threats like vessel collision, but this has not been studied or measured. There are also no studies that evaluate the behavioral effects of suspended sediments on mobile prey species. Johnson (2018) suggested that any effects on sea turtle prey species from suspended sediments, sediment deposition, or turbidity may cause turtles to move to other areas and then return to the affected areas at some time in the future. It is not believed that dredging would permanently change the sea turtle prey base (Michel et al. 2013) and wind projects would implement turbidity reduction measures to contain the silt and sediment stirred up by dredging.

Given the available information, sediment disturbances associated with both ongoing and planned non-offshore-wind and offshore wind activities are not likely to result in any discernible effects on sea turtles, and the risk of injury or mortality of individual sea turtles resulting from dredging necessary to support offshore wind projects would be low. Cable emplacement and maintenance would therefore result in minor impacts on sea turtles and population-level effects are unlikely to occur.

Electric and magnetic fields and cable heat: EMFs emanate constantly from installed telecommunication and electrical power transmission cables. During operations of ongoing and planned offshore wind projects (Appendix D), cables would produce EMFs. Submarine power cables in the geographic analysis area for sea turtles are assumed to be installed with appropriate shielding and burial depth to reduce potential EMFs to low levels (BOEM 2007). Although the EMF would exist as long as a cable was in operation, impacts would likely be difficult to detect, if they occur at all. Recent reviews by Bilinski (2021) of the effects of EMFs on marine organisms concluded that though sea turtle species can detect electromagnetic fields and use the earth's magnetic field for migration and navigation, no observed effects from subsea cable EMFs have been reported for any sea turtle species. Additionally, transmission cables using HVAC, emit ten times less magnetic field than HVDC (Taormina et al. 2018), and cable shielding, and burial would further reduce the level of EMF produced.

Sea turtles appear to have a detection threshold of magnetosensitivity and behavioral responses to field intensities ranging from 0.0047 to 4000 µT for loggerhead turtles, and 29.3 to 200 µT for green turtles, with other species likely similar due to anatomical, behavioral, and life history similarities (Normandeau et al. 2011). Juvenile or adult sea turtles foraging on benthic organisms may be able to detect magnetic fields while they are foraging on the bottom near the cables and up to potentially 82 feet (25 meters) in the water column above the cable. Juvenile and adult sea turtles may detect the EMF over relatively small areas near cables (e.g., when resting on the bottom or foraging on benthic organisms near cables or concrete mattresses). There are no data on impacts on sea turtles from EMFs generated by underwater cables, although anthropogenic magnetic fields can influence migratory deviations (Luschi et al. 2007; Snoek et al. 2016, 2020). However, any potential impacts from AC cables on turtle navigation or orientation would likely be undetectable under natural conditions, and thus would be insignificant (Normandeau et al. 2011).

Heat transfer into surrounding sediment associated with buried submarine high-voltage cables is possible (Emeana et al. 2016). However, heat transfer is not expected to extend to any appreciable effect into the water column due to the use of thermal shielding, the cable's burial depth, and additional cable protection such as scour protection or concrete mattresses for cables unable to achieve adequate burial depth. As a result, heat from submarine high-voltage cables is not expected to affect sea turtles.

Impacts from EMFs from ongoing and planned non-offshore-wind activities would likely be negligible for sea turtles as it would be of the lowest level of detection and no perceptible consequences to individuals or populations are expected. Impacts from EMFs from ongoing and planned offshore wind activities would similarly be negligible for sea turtles.

Noise: The siting, construction and installation, O&M, and conceptual decommissioning of ongoing and planned offshore wind farms is expected to introduce several types of underwater sound into the marine environment. Physical descriptions of sounds associated with these activities can be found in Appendix J, *Introduction to Sound and Acoustic Assessment*. As discussed in Section 3.5.7.1, hearing sensitivity of sea turtles is restricted to a range of low frequencies. The expected impacts of each of these sources on sea turtles is discussed below.

Geophysical and Geotechnical Surveys

The active acoustic sources used in site characterization surveys introduce noise into the water in areas around sites of investigation. See Appendix J for a physical description of these sounds. Only a subset of geophysical sources (e.g., boomers, sparkers) are likely to be audible by sea turtles given the frequency range of the sounds and the hearing range of turtles, but they may cause short-term behavioral disturbance, avoidance, or stress (NSF and USGS 2011). Recently, BOEM and USGS characterized underwater sounds produced by high-resolution geophysical sources and their potential to affect marine animals, including sea turtles (Ruppel et al. 2022). In addition to frequency range, other characteristics of the sources—like the source level, duty cycle, and beamwidth—make it very unlikely that these sources would result in behavioral disturbance of sea turtles, even without mitigation (Ruppel et al. 2022). Given the intensity of noise generated by this equipment (Crocker and Frantantonio 2016; Crocker et al. 2019) and short duration of proposed surveys, it is unlikely to result in PTS for any turtle species. Although temporary displacement or behavioral responses may occur, they would not result in biologically notable consequences and impacts on sea turtles would be minor and would have no stock or population-level effects. Likewise, geotechnical surveys may introduce low-level, intermittent, broadband noise into the marine environment, though these sounds are unlikely to result in behavioral disturbance given their low source levels and intermittent use.

Unexploded Ordnance Detonations

There are several options for UXO removal that include stabilizing the UXO for safe relocation without detonation, low-order detonation designed to reduce the net explosive yield of a UXO compared to conventional “blow-in-place” techniques, and high-order detonation in which the full explosive weight is detonated in the place where the object is found. The appropriate method of removal for each project will depend on the condition of the UXO (i.e., how stable it is for potential relocation) and surrounding environmental conditions. For a physical description of the sounds produced by underwater explosions, see Appendix J. Underwater explosions of this type generate shock waves, or a nearly instantaneous wave characterized by extreme changes in pressure, both positive and negative. This shock wave can cause injury and mortality to a sea turtle, depending on how close an animal is to the blast. Similar to effects seen in mammals, the physical range at which injury or mortality could occur will vary based on the amount of explosive material in the UXO, size of the turtle, and the location of the turtle relative to the explosive. Injuries may include hemorrhages or damage to the lungs, liver, brain, or ears, as well as auditory impairment such as PTS and TTS (Ketten 2004; Finneran et al. 2017). Potential impacts from *in-situ* UXO detonation would result from both low- and high-order detonation methods, with less intense pressures and noise produced from the low-order detonations. However, though low-order detonation methods would generally be preferred by projects, they may not always fully eliminate the risk of high-order detonation, so potential impacts from *in-situ* UXO disposal need to be assessed assuming high-order detonations would occur. Noise generated during detonation is dependent on the size and type of UXO, amount of charge used, location, water depth, soil conditions, and burial depth of the UXO. Higher order detonation methods, if they were to occur, would present the greatest risk of impact on sea turtles, as this could result in mortality, non-auditory injuries (e.g., hemorrhages, lung damage, ear damage), and auditory injuries such as PTS or TTS and would present moderate impacts on sea turtles. UXO detonations may result in the loss of individuals but would not be expected to result in population-level effects given the irregular occurrence of high-order detonations expected.

Impact and Vibratory Pile-Driving

The construction of WTG and OSS foundations in the geographic analysis area is expected to occur intermittently over an approximate 9-year period between 2023 and 2030. During the installation of foundations, underwater sound related to pile-driving would likely occur for less than 12 hours per day per project. The sound generated during pile-driving will vary depending on the piling method (impact or vibratory), pile material, size, hammer energy, water depth, and substrate type. A description of the physical qualities of pile-driving noise can be found in Appendix J. These sounds may affect sea turtle species in the area. The impacts would vary in extent and intensity based on the scale and design of each project, as well as the schedule of project activities.

Impulsive noise from impact pile-driving during offshore wind development, due to the anticipated frequency and spatial extent of effect, represents the highest risk of exposure and potential for adverse effects on sea turtles in the geographic analysis area. While these potential effects are acknowledged, their significance is unclear because sea turtle sensitivity and behavioral responses to pile-driving noise are not well known and are subjects of ongoing study. However, several studies conducted on responses to seismic airguns, an impulsive signal that can serve as a proxy, have shown that a range of behavioral effects are possible. In these studies, caged and free-swimming sea turtles are reported as reacting to the sounds by initiating a startle dive (Weir 2007; DeRuiter and Doukara 2012), rising to the surface (Lenhardt 1994), and altering swimming patterns (McCauley et al. 2000). In other studies, sea turtles avoided the airgun source initially, but authors suggested that animals likely habituated to the source over time (Moein et al. 1994; Lenhardt 2002; Hazel et al 2007). This type of noise habituation has been demonstrated even when the repeated exposures were separated by several days (Bartol and Bartol 2012; U.S. Department of the Navy 2018). The accumulated stress and energetic costs of avoiding repeated exposures to pile-driving noise over a season or life stage could have long-term effects on survival and fitness (U.S. Department of the Navy 2018).

Vibratory pile-driving may be used prior to impact pile-driving to reduce the risk of pile run for some offshore wind projects and during export cable installation and port facility construction. The term *pile run* refers to the quick penetration of a pile into the seabed as a result of its high self-weight and low resistance from the seabed. A more detailed description of vibratory pile-driving noise can be found in Appendix J. Vibratory pile-driving is expected to create nearly continuous, non-impulsive, low-frequency noise. Compared to impact pile-driving, this means the most damaging elements of sound exposure (the rapid rise time) would not pose a risk to sea turtles like they would for impulsive noise sources. However, like with any continuous source, if animals remain within the area for long enough, they could still experience auditory fatigue. At larger ranges, acoustic masking is possible. However, vibratory pile-driving activities would be relatively short term, occurring over approximately 4 hours per pile for the foundations, and over several days for export cable installation.

Sea turtles that are exposed to pile-driving have the potential to experience acoustic injury such as TTS or PTS. In theory, reduced hearing sensitivity could limit the ability to detect predators, prey, or potential mates and reduce the survival and fitness of affected individuals. However, the role and importance of sound in these biological functions for sea turtles remains poorly understood (Lavender et al. 2014).

Based on the available information provided above and in Appendix J, impacts on sea turtles from construction-related pile-driving noise would be limited to effects on a small number of individuals. However, given the number of projects anticipated within the geographic analysis area through 2030 (Appendix D), impact pile-driving would have moderate impacts on sea turtles due to the potential for severe effects on individuals but no effects on population viability for any species. Vibratory pile-driving is expected to be less impactful for sea turtles and would result in detectable impacts that are minor and would not result in population-level effects.

Foundation Drilling

Drilling activities for the WTG and OSS foundations used prior to pile-driving activities to remove soil or boulders from inside the piles in cases of pile refusal may produce SPL of 140 dB re μPa at 3,280 feet (975 meters) (Austin et al. 2018). This would exceed the continuous noise threshold of 120 dB re 1 μPa (Table 3.7-3) beyond 3,000 feet (914 meters), but these events are expected to be short term, which limits the sea turtles potentially present during construction. While behavioral responses may occur from drilling, they are not expected to be long lasting or biologically significant to sea turtle populations and are therefore minor.

Vessels

Vessel noise associated with non-offshore-wind activities is likely to be present throughout the sea turtle geographic analysis area at a nearly continuous rate due to the prevalence of commercial shipping, fishing, and recreational boating activities which are ongoing and would be expected to continue in the geographic analysis area. During both the construction and operational phases of ongoing and planned offshore wind projects, several types of vessels would be used to transport crew and supplies, and during construction, dynamic positioning systems may be used to keep the pile-driving vessel in place. A description of the physical qualities of vessel noise can be found in Appendix J. Construction and operational vessel noises are the most broadly distributed source of non-impulsive noise associated with offshore wind projects. Sea turtle exposure to underwater vessel noise would increase as a result of ongoing and planned offshore wind projects, especially during construction periods (Appendix D, Table D1-21). Sea turtles are less sensitive to sound compared to faunal groups like marine mammals and no injury or behavioral effects from vessel noise are anticipated for ongoing and planned offshore wind projects. It is unlikely that received levels of underwater noise from vessel activities would exceed PTS thresholds for sea turtles, as the PTS threshold for non-impulsive sources is an SEL_{24h} of 200 dB re 1 μPa^2 s (NMFS 2023), which is comparable to the maximum source level reported for large shipping vessels (Appendix J). Hazel et al. (2007) demonstrated that sea turtles only appear to respond behaviorally to vessels at approximately 33 feet (10 meters) or closer.

Vessel noise effects for ongoing and planned offshore wind projects are expected to be broadly similar to noise levels from existing vessel traffic in the region. Nonetheless, periodic localized, short-term behavioral impacts on sea turtles could occur, but sea turtle behavioral disturbances are anticipated only to occur within a relatively small area around the vessels and are expected to return to normal when the vessel moves away. Therefore, the effects of vessel noise from offshore wind activities would be minor. No population-level effects are expected to occur.

Dredging, Trenching, and Cable-Laying

Preparing a lease area for turbine installation and cable-laying may require jetting, plowing, or removal of soft sediments, as well as the excavation of rock and other material through various dredging methods. Cable installation vessels are likely to use dynamic positioning systems while laying the cables. The sound associated with dynamic positioning generally dominates over other sound sources present, especially in relation to dredging, trenching, and cable-laying activities. A description of the physical qualities of these sound sources can be found in Appendix J. Given the estimated source levels (Appendix J) and transitory nature of these sources, exceedance of PTS and TTS sound levels are not likely for sea turtles (Heinis et al. 2013), and behavioral disturbances would likely be low-intensity and localized, and result in negligible impacts on sea turtles.

Aircraft

Rotary wing aircraft (helicopters) may be used during initial site surveys, protected species monitoring prior to and during construction, facility monitoring, and crew transfers during construction. Sea turtle sensitivity to airborne noise is not well studied, but available information indicates potential disturbances would likely be minimal. Bevan et al. (2018) observed no evident behavioral responses from sea turtles exposed to drones flown directly overhead at altitudes ranging from 50 to 102 feet (18 to 31 meters). When aircraft travel at relatively low altitude, aircraft noise has the potential to elicit stress or behavioral responses (e.g., diving or swimming away or altered dive patterns) (BOEM 2017; NSF and USGS 2011; Samuel et al. 2005). Aircraft would operate through the NY Bight area at altitudes of 1,000 feet (305 meters) or more except when landing or departing from service vessels. NMFS (2016) determined that noise and disturbance effects on sea turtles from aircraft operations for a single offshore wind project would be negligible, and effects from aircraft use during multiple projects within the geographic analysis area would similarly be expected to be negligible as these noises are not expected to overlap in time or space.

WTG Operations

No biologically notable effects on sea turtles are anticipated from noise produced by WTG operation. Noise associated with operational WTGs would be expected to attenuate below ambient levels at a relatively short distance from WTG foundations (Miller and Potty 2017; Thomsen et al. 2015; Tougaard et al. 2009). Maximum anticipated noise levels produced by operational WTGs are estimated to be between 125 and 130 dB re 1 μPa m (Lindeboom et al. 2011; Tougaard et al. 2009). HDR (2019) measured SPL below 120 dB re 1 µPa at 164 feet (50 meters) from operating turbines at the Block Island Wind Farm, which are below the sound level thresholds expected to cause sea turtle PTS, TTS, and behavioral disturbance (NMFS 2023). Additionally, current generation WTGs use direct drive motors that could result in a sound decrease of approximately 10 dB from WTGs using gear boxes that were considered in prior studies (Stöber and Thomsen 2021). However, a review of published literature also identified an increase in underwater source levels (up to 177 dB re 1 µPa) with increasing power size with a nominal 10 MW WTG (Stöber and Thomsen 2021), and given the number of foundations expected within the sea turtle geographic analysis area through 2030 (Appendix D), the presence of WTG operational noise would be a persistent presence throughout the sea turtle geographic analysis area. Impacts on sea turtles would therefore be minor as the behavioral responses would be detectable but would not be expected to result in any population-level effects.

Port utilization: The development of an offshore wind industry in the sea turtle geographic analysis area may incentivize the expansion or improvement of regional ports to support planned projects. As discussed in Section D.2.5 of Appendix D, a number of dredging and port improvement projects at ports within the NY Bight area have either been proposed or are considered reasonably foreseeable including Port Ivory, the Port of Albany, the Port of Coeymans, the Southern Brooklyn Marine Terminal, the Brooklyn Navy Yard, and Arthur Kill Terminal in New York; the Paulsboro Marine Terminal, Lower Alloways Creek, High Bar Harbor, and Barnegat Light Stake channels in New Jersey; and Barnegat Bay, New Jersey. Further details of each of these proposed or foreseeable projects are provided in Appendix D.

Any port expansion could increase the total amount of disturbed (modified or lost) benthic habitat and result in impacts on some sea turtle prey species. However, given that port expansions would likely occur in subprime areas for foraging and the disturbance would be relatively small in comparison to the overall sea turtle foraging areas in the geographic analysis area, port expansions are not expected to affect sea turtles. Dredging for port facility improvement could lead to additional impacts on turtles from incidental entrainment, impingement, or capture. Most observed injury and mortality events in the United States due to dredging activities were associated with hopper dredging in and around core habitat areas in the southern portion of the geographic analysis area and in the Gulf of Mexico outside the geographic analysis area (Michel et al. 2013; NMFS 2020). Ongoing maintenance dredging of these facilities may increase related risks to individual turtles over the lifetime of the facilities; however, typical mitigation measures such as timing restrictions should minimize this potential. Additionally, the size, scope, and location of the dredging activities conducted for ongoing and planned offshore wind projects would be less than that identified for other projects such as beach nourishment or port deepening, and the type of equipment used reduces the risk of entrainment or impingement. Compared to the dredging activities for ongoing and planned offshore wind projects, navigation dredging projects, which occur primarily in channels close to shore, generally pose a greater risk of entrainment of sea turtles because of their tendency to concentrate in channels (Ramirez et al. 2017). For example, the number of sea turtles entrained by hopper dredging in BOEM offshore borrow areas has historically been relatively low when compared to navigation channel dredging (Ramirez et al. 2017). Between 1995 and 2015, there were 69 reported sea turtle takes in the North Atlantic (i.e., north of North Carolina) by trailing suction hopper dredges, versus approximately 260 taken in hopper dredges operating in the South Atlantic. The takes per project across the entire South Atlantic were estimated to be 0.96 (the North Atlantic was not analyzed). Therefore, given the limited extent and location of offshore wind project dredging in comparison to navigation projects, offshore wind projects are not expected to result in population effects as few to no takes of sea turtles would reasonably be expected. The risk of injury or mortality to individual sea turtles resulting from dredging associated with ongoing and planned offshore wind projects is low.

Port utilization of ongoing and planned non-offshore-wind and offshore wind activities would affect sea turtles through disturbances to benthic habitat, vessel traffic (discussed further in the *Vessel Traffic* IPF), and entrainment risk in dredging equipment. Based on the available information, this would be expected to result in minor impacts on sea turtles; although impacts on individuals would be detectable and measurable, no population-levels effects are expected.

Presence of structures: The Mid-Atlantic region currently has more than 130 artificial reefs. Hard-bottom (scour control and rock mattresses) and vertical structures (bridge foundations, Block Island Wind Farm WTGs, and two WTGs with the CVOW-Pilot project) in a soft-bottom habitat can create artificial reefs, thus inducing the reef effect (Taormina et al. 2018; NMFS 2015). The reef effect is usually considered a beneficial impact associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for sea turtles compared to the surrounding soft bottoms. The presence of structures associated with non-offshore-wind development in nearshore coastal waters has the potential to provide habitat for sea turtles as well as preferred prey species. This reef effect has the potential to result in long-term, low-intensity, beneficial impacts. Bridge foundations will continue to provide foraging opportunities for sea turtles with measurable benefits to some individuals.

The addition of WTGs offshore in the geographic analysis area could increase sea turtle prey availability through the creation of new hard-bottom habitat, increasing pelagic productivity in local areas, or promoting fish aggregations at foundations (Bailey et al. 2014). Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, discusses reef creation and the potential for anthropogenic structures to attract benthic fauna and fish. The enhancement of these resources around new wind farm structures can provide additional foraging opportunities for sea turtles that may result in beneficial effects given the broad geographic range of species during their annual foraging migrations. These beneficial effects could be reversed following project decommissioning, as all project structures could be removed and any artificial reef creation would be reversed. The decision to remove structures or to leave them in place would be a part of the decommissioning application submitted to BSEE and approved or disapproved by BOEM at the project-specific stage.

Additionally, potential beneficial effects may be offset given the increased risk of entanglement due to derelict fishing gear on the structures. The presence of structures during offshore wind project operations has the potential to concentrate recreational fishing around foundations, potentially increasing the risk of sea turtle entanglement in both vertical and horizontal fishing lines and increasing the risk of injury and mortality due to infection, starvation, or drowning. While sea turtles are capable of remaining submerged for long periods, they appear to rapidly consume oxygen stores when entangled and forcibly submerged in fishing gear (Lutcavage and Lutz 1997). If there is an increase in recreational fishing in a wind farm area, it is likely that this will represent a shift in fishing effort from areas outside a wind farm area to within a wind farm area or an increase in overall effort. These structures could also result in fishing vessel displacement or gear shift. The potential impact on sea turtles from these changes is uncertain; however, if a shift from mobile gear (trolling) to fixed gear (hook and line) occurs due to inability of the fishermen to maneuver mobile gear, there would be a potential increase in the number of vertical lines, resulting in an increased risk of sea turtle interactions with fishing gear. Given vessel safety concerns regarding being too close to foundations and other vessels, the likelihood of recreational fishermen aggregating around the same turbine foundation at the same time is low. Due to foraging strategies, leatherback and loggerhead sea turtles are more likely to be exposed to recreational fishing lines in the pelagic WTG area. Conversely, Kemp's ridley and green sea turtles are less likely to be exposed to recreational fishing lines in the pelagic WTG area and are in the geographic analysis area at much lower densities than loggerhead and leatherback sea turtles. Human-made structures, especially tall vertical structures like WTG and OSS foundations, alter local water flow at a fine scale and could result in localized impacts on sea turtle prey distribution and abundance. A discussion of the effects of altered water flow can be found in Section 3.5.6, *Marine Mammals*. The presence of many WTG structures could affect oceanographic and atmospheric conditions in ways that alter local environments and potentially increase primary productivity in the vicinity of these structures (Carpenter et al. 2016; Schultze et al. 2020). However, this may not translate to a beneficial increase in sea turtle prey abundance if the increase in primary productivity is consumed by filter feeders (e.g., mussels) that colonize the surface of the structures (Slavik et al. 2019).

The long-term effects of offshore structure development on ocean productivity and sea turtle prey species, and therefore on sea turtles, are difficult to predict with certainty because they are expected to vary by location, season, and year depending on broader ecosystem dynamics. For example, the presence of new hard surfaces could increase the abundance of associated organisms (e.g., mollusks, crustaceans) on and around the structures, providing a prey resource for sea turtles. Increased primary and secondary productivity in proximity to hard-bottom structures could increase the abundance of prey species like jellyfish (English et al. 2017). Additionally, hard-bottom (scour control, cable protection) and vertical structures (WTG and OSS foundations) in a soft-bottom habitat can create a three-dimensional artificial reef structure, thus inducing the "reef effect" and resulting in higher densities and biomass of mollusks, fish, and decapod crustaceans (Causon and Gill 2018; Taormina et al. 2018). Recent studies have found increased biomass for benthic fish and invertebrates, and possibly for pelagic fish, sea turtles, and birds as well (Raoux et al. 2017; Pezy et al. 2018; Wang et al. 2019), indicating that offshore wind facilities can generate beneficial long-term impacts on local ecosystems, translating to increased foraging opportunities for sea turtle species. Sea turtles may also use vertical structures for shelter from strong currents to conserve energy and for cleaning their carapace (Barnette 2017). In contrast, increased fish biomass around the structures could attract commercial and recreational fishing activity, creating an increased risk of injury or mortality from gear entanglement and ingestion of debris (Berreiros and Raykov 2014; Gregory 2009; Vegter et al. 2014; Shigenaka et al. 2021).

Some level of displacement of sea turtles from ongoing and planned offshore wind lease areas into areas with a greater potential for interactions with ships or fishing gear could occur, particularly during construction phases. However, the addition of structures could locally increase pelagic productivity and prey availability for sea turtles and decrease the likelihood of long-term displacement from the ongoing and planned offshore wind lease areas. While the effect would be present long-term throughout the life of ongoing and planned offshore wind projects, the overall impact is minor and would not be expected to affect the viability of any sea turtle populations.

Traffic: Current activities contributing to traffic in the geographic analysis area include port traffic levels, fairways, TSS, commercial vessel traffic, recreational and fishing activity, and scientific research and surveys. Propeller and collision injuries from boats and ships are common in sea turtles. Vessel strike is an increasing concern for sea turtles, especially in the southeastern United States where development along the coasts is likely to result in increased recreational boat traffic (NMFS and USFWS 2007; Hazel et al. 2007; Barco et al. 2016; Foley et al. 2019). In the United States, the percentage of strandings of loggerhead sea turtles attributed to vessel strikes increased from approximately 10 percent in the 1980s to a record high of 20.5 percent in 2004 (NMFS and USFWS 2007). Sea turtles are most susceptible to vessel collisions in coastal waters, where they forage from May through November. Vessel speed may exceed 10 knots in such waters, and evidence suggests that they cannot reliably avoid being struck by vessels exceeding 2 knots (Hazel et al. 2007). Sea turtle strandings reported to have vessel strike injuries have been reported to be as high as 25 percent in the Chesapeake Bay in Virginia (Barco et al. 2016), and Foley et al. (2019) reported that roughly one-third of stranded sea turtles in Florida had injuries indicative of a vessel strike. Increased vessel traffic associated with ongoing and planned offshore wind activities could result in a higher number of vessel strikes, resulting in sea turtle injury or mortality. However, despite the potential for individual fatalities, no population-level impacts on sea turtles are expected. It is anticipated that projects will adhere to vessel speed restrictions and visual monitoring requirements set forth by NMFS (87 *Federal Register* 46921) which, while geared primarily towards marine mammals, will help reduce the risk of a strike occurring that could result in a serious injury or mortality. PSO sightings data indicate sighting rates for sea turtles during vessel operations were approximately 13 sea turtle detections per 100 hours of vessel effort (Marine Ventures International, Inc. 2022; RPS 2021). These detection rates are relatively high, and even with these high detection rates there were only 18 vessel strike mitigation actions required (2.8 percent of all sea turtle detections) and no strikes were reported.

Therefore, given the risk of impact of vessel strikes on sea turtles and the level of traffic expected from ongoing and planned non-offshore-wind and offshore wind activities, impacts on sea turtles are expected to be moderate as vessel strikes may result in long-term impacts on individuals, but the populations would be expected to recover, and the viability of these populations would not be affected.

Survey gear utilization (biological/fisheries monitoring surveys): A primary threat to sea turtles is their unintended capture in fishing gear, which can result in drowning or cause injuries that lead to mortality (e.g., swallowing hooks). For example, trawl fishing is among the greatest continuing primary threats to the loggerhead turtle (NMFS and USFWS 2019) and sea turtles are also caught as bycatch in other fishing gear including longlines, gillnets, hook and line, pound nets, pot/traps, and dredge fisheries.

A substantial impact of commercial fishing on sea turtles is the entrapment or entanglement that occurs with a variety of fishing gear. Although the requirement for the use of bycatch mitigation measures, such as “turtle excluder devices” in trawl fishing gear, has reduced sea turtle bycatch, Finkbeiner et al. (2011) compiled data on sea turtle bycatch in U.S. fisheries and found that in the Atlantic, a mean estimate of 137,700 interactions, 4,500 of which were lethal, occurred annually since implementation of bycatch mitigation measures. Stationary gear poses a risk of entanglement for ESA-listed sea turtle species due to buoy and anchor lines. Of all the Atlantic sea turtles, the leatherback seems to be the most vulnerable to entanglement in trap/pot fishing gear, possibly due to its physical characteristics, diving and foraging behaviors; distributional overlap with the gear; and the potential attraction to prey items that collect on buoys and buoy lines at or near the surface (NMFS 2016). Individuals entangled in pot gear generally have a reduced ability to forage, dive, surface, breathe, or perform other behaviors essential for survival (Balazs 1985). In addition to mortality, gear entanglement can restrict blood flow to extremities and result in tissue necrosis and death from infection. Individuals that survive may lose limbs or limb function, decreasing their ability to avoid predators and vessel strikes (NMFS 2016). A reduction of sea turtle interactions with fisheries is a priority for sea turtle recovery. The impacts of survey gear utilization associated with biological and fisheries surveys monitoring for ongoing and planned offshore wind activities on sea turtles are expected to be minor given the relatively limited extent and duration of these surveys; impacts on individuals would be detectable and measurable but would not lead to population-level effects.

Lighting: Artificial lighting from ongoing and planned offshore wind and non-offshore-wind projects may be produced by vessel traffic or project structures. Ocean vessels such as ongoing commercial vessel traffic, recreational and fishing activity, and scientific research and survey vessels have an array of lights including navigational, deck lights, and interior lights. Such lights have some limited potential to attract sea turtles although the impacts, if any, are expected to be localized and temporary. Artificial lighting on nesting beaches or in nearshore habitats has the potential to result in disorientation to nesting females and hatchling turtles. Artificial lighting on the OCS does not appear to have the same potential for such effects. Decades of oil and gas platform operation in the Gulf of Mexico, which can have considerably more lighting than offshore WTGs, has not resulted in any known impacts on sea turtles (BOEM 2019). Based on the available information, artificial lighting from ongoing and planned offshore wind and non-offshore-wind projects would be expected to result in negligible impacts on sea turtles; although impacts on individuals would be detectable and measurable, no population-levels effects are expected.

3.5.7.3.4 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, sea turtles would continue to be affected by existing environmental trends and ongoing activities. In addition to ongoing climate change, BOEM expects a range of temporary to long-term impacts (disturbance, displacement, injury, mortality, and reduced foraging success) on sea turtles, primarily from exposure to construction-related underwater noise (specifically UXO detonations and impact pile-driving), vessel traffic (i.e., vessel strike), entanglement, seabed disturbance, and changes in habitat from presence of new structures acting as artificial reefs, altering hydrodynamics, and introducing secondary entanglement risk. Ongoing activities are expected to continue to result in **negligible** to **moderate** impacts on sea turtles. Although impacts on individual sea turtles and their habitat are anticipated from pile-driving, vessel traffic, UXO detonation, and other IPFs, they are recoverable and likely would not affect the population viability of any sea turtle species.

Cumulative Impacts of the No Action Alternative. BOEM anticipates that planned offshore wind and non-offshore-wind activities would result in moderate impacts on sea turtles. These impacts are primarily driven by ongoing underwater noise impacts (UXO detonations, impact pile-driving), traffic (i.e., vessel strike), entanglement, and seabed disturbance. Although impacts on individual sea turtles and their habitat are anticipated, populations are expected to recover sufficiently.

Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and sea turtles would continue to be affected by natural and human-caused IPFs. BOEM anticipates that the overall impacts associated with the No Action Alternative, when combined with all other planned activities (including offshore wind without the development of six NY Bight projects), in the geographic analysis area would likely result in **negligible** to **moderate** impacts on sea turtles because the anticipated impact would likely be notable and measurable, but populations are expected to recover and no effects on population viability are anticipated. **Minor beneficial** impacts for sea turtles are expected to result from the presence of structures primarily due to an increase in foraging opportunity as a result of the artificial reef effect, which may be offset given the increased risk of entanglement due to derelict fishing gear on the structures.

3.5.7.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Sea Turtles

3.5.7.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Accidental releases: Accidental releases of fuel, fluids, hazardous materials, trash, and debris may increase as a result of one project developed in the NY Bight area. The risk of any type of accidental release would be increased primarily during construction when additional vessels are present and during the refueling of primary construction vessels at sea. BOEM prohibits the discharge or disposal of solid debris into offshore waters during any activity associated with construction and operation of offshore energy facilities (30 CFR 250.300). USCG also prohibits dumping of trash or debris capable of posing entanglement or ingestion risk (International Convention for the Prevention of Pollution from Ships, Annex V, Public Law 100–200 [101 Stat. 1458]). Project activities would comply with the federal requirements for the prevention and control of oil and fuel spills, reducing the likelihood of an accidental release. Further, implementation of an OSRP, which is required information with any future project COP submitted for the NY Bight area (30 CFR 585.627(c)), would decrease potential impacts from spills and informational training on proper storage and disposal practices would reduce the likelihood of accidental discharges and spills from occurring. The impacts of one NY Bight project from accidental releases of hazardous materials and trash/debris would, therefore, not increase the risk beyond that described under the No Action Alternative. In the unlikely event of an accidental oil spill, impacts would be sublethal due to quick dispersion, evaporation, and weathering, all of which would limit the amount and duration of exposure of sea turtles to hydrocarbons. The combined regulatory requirements and any additional directives from BOEM and other applicable federal agencies would effectively avoid accidental debris releases and avoid and minimize the impacts from accidental spills such that impacts on sea turtles are unlikely to occur. Therefore, though the consequence to individuals resulting from ingestion of debris could be fatal, the likelihood of this occurring is so low that impacts of accidental releases as a result of one NY Bight project would be of low intensity, short term, and localized. Therefore, the effects on sea turtles from accidental releases and discharges would likely be minor during construction and installation.

The impacts of one NY Bight project during O&M from accidental releases of hazardous materials and trash/debris would be the same, though slightly reduced, as that described above for construction and installation. During O&M, at-sea refueling for construction vessels would not likely occur, thereby reducing overall risk for an accidental spill. All other impacts of accidental releases during O&M would be the same as during construction and installation and would therefore remain minor for sea turtles.

Discharges/intakes: The use of HVDC cables is possible for one NY Bight project, which would require HVDC converter intakes on the up to five OSSs. Therefore, intakes and discharges related to cooling offshore wind converter stations are possible for one NY Bight project. Potential effects resulting from intake and discharge use include altered micro-climates of warm water surrounding outfalls, altered hydrodynamics around intakes/discharges, prey entrainment, association with intakes if prey aggregates on intake screens from which sea turtles scavenge, and direct entrainment or impingement. As discussed in Section 3.5.7.3.3, these impacts on sea turtles are largely discountable given the small number of OSSs. Therefore, the impact as a result of one NY Bight project from discharges and intakes, though long term, would be low in intensity, highly localized, non-measurable, and negligible for sea turtles.

Cable emplacement and maintenance: One NY Bight project would result in seafloor disturbance from installation of up to 280 WTGs, up to 5 OSSs, up to 550 miles (885 kilometers) of interarray cable, and up to 929 miles (1,495 kilometers) of export cable (Section 2.1.2, *Alternative B – No Identification of AMMM Measures at the Programmatic Stage*), which would result in turbidity effects with the potential to have temporary impacts on some sea turtle prey species (see Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*). Jack-up vessels and vessel anchoring will include additional seafloor disturbance. These effects would be increased primarily during construction and installation activities as cable installation for the offshore export cables and interarray cables are gradually added. As provided in Table 2-2 in Chapter 2 of this PEIS, the most common methods expected for cable emplacement are mechanical or jet plowing. Additional options include jet trencher, precision installation (using a remotely operated vehicle/diver), mechanical cutter, controlled flow excavator, and vertical injection. In general, plumes generated during trenching of offshore areas would likely be limited to within a few feet vertically and a few hundred feet horizontally, and would be expected to settle out of the water column entirely within 24 hours after the completion of jetting operations. The jet plow embedment process for cable installation will, therefore, result in short-term and localized heightened turbidity. Trenching with a jet plow in areas of shallower water depths could cause plumes to nearly reach the surface of the water, and alternate cable emplacement methods may be required for some areas, such as dredging to install cable along sand waves. Dredging using mechanical dredging techniques would also contribute additional impacts on sea turtles due to the risk of impingement and entrainment.

Sea turtles in or near the one NY Bight project area would likely be foraging or migrating between foraging and nesting habitats. Prey species within the one NY Bight project area could include benthic species that could be affected by seabed disturbance associated with installation of the offshore export cables and interarray cables. This disturbance would be short term, and prey species would be expected to return to the area once the cables are installed. Similar levels of impact would be realized during cable maintenance. Because impacts during cable installation or maintenance would be temporary and localized, the impact of project activities on sea turtles would be negligible.

Only intermittent, localized cable maintenance is predicted during the O&M phase of one NY Bight project which would only disturb the seafloor if maintenance required exposing the cables. In case of insufficient burial or cable exposure, whether attributable to natural or human caused issues, appropriate remedial measures will be taken including reburial or placement of additional protective measures. If a cable failure occurs, an appropriate cable repair spread will be mobilized. During these remedial activities, if they occur, sediment plumes would be limited to directly above the seabed and not extend into the water column. Suspended sediments due to jet plowing are expected to remain localized to the area of disturbance and settle quickly to the seafloor. Elevated turbidity levels would be short term, highly localized, and temporary. Therefore, effects to sea turtles would be similar to those described for the construction and installation phase and impacts would be non-measurable and negligible.

Electric and magnetic fields and cable heat: As discussed in Section 3.5.7.3.3, Normandeau et al. (2011) and Bilinski (2021) reviewed the potential effects of EMFs from offshore wind energy projects on sea turtles and other species and concluded that sea turtles would be insensitive to EMF effects from subsea electrical cables. One NY Bight project-related EMFs are likely to be below the threshold detectable to sea turtles and, therefore, indistinguishable from natural variability in the analysis area. Export and interarray cables may be either HVAC or HVDC; potential effects to sea turtles from HVAC cables are considerably reduced compared to HVDC cables. However, Taormina et al. (2018) found that, though EMF from HVDC cables is higher than from HVAC cables, there were no significant differences in resettlement of benthic species over the cable a few years after installation compared to baseline regions, so sea turtles foraging on benthic prey species would not be expected to experience long-term changes in prey availability. Hutchison et al. (2018) found notable behavioral responses of American lobster and little skate in response to EMF from HVDC cables; however, it did not constitute a barrier to movement across the cable for either species, also indicating that long-term changes to sea turtle prey distribution are unlikely to occur. Additionally, export and interarray cables would be buried at a depth ranging from 3 to 19.6 feet (0.9 to 6 meters) and 3 to 9.8 feet (0.9 to 3 meters), respectively, and installed with appropriate cable shielding and scour protection (where needed). These factors will effectively limit sea turtle exposure to both EMFs and heat originating from the project cables. Areas where cable lie exposed on the seafloor could potentially result in EMFs that are detectable by sea turtles, but this area would be small, limited to extending only a few feet from the cable.

These factors indicate that the likelihood of sea turtles encountering detectable EMF and heat effects is low, and any exposure would be below levels associated with measurable biological effects. Therefore, EMF effects on sea turtles would be negligible.

Noise: Activities associated with one NY Bight project that could cause underwater noise effects on sea turtles are UXO detonations, impact and vibratory pile driving (during installation of WTG and OSS foundations), geophysical (i.e., HRG) and geotechnical surveys, vessel traffic, aircraft, cable laying or trenching and dredging, and potential drilling during construction. Project construction activities could generate underwater noise and result in non-auditory injury, auditory injury (i.e., PTS), behavioral disturbance, and masking effects on sea turtles.

Geophysical and Geotechnical Surveys

HRG survey equipment would likely be used during preconstruction surveys to support design finalization. This equipment produces noise in the 1.1 to 200 kilohertz frequency range at sound levels that may exceed sea turtle behavioral thresholds. No injurious impacts are expected for sea turtles from any HRG survey equipment (Baker and Howsen 2021). Behavioral disturbances may occur up to 295 feet (90 meters) from impulsive sources and up to 6.6 feet (2 meters) from non-impulsive sources assuming equipment are operating at the highest power settings (Baker and Howsen 2021). Some low-level behavioral disturbances could potentially occur during project-related HRG surveys; however, due to the relatively short duration of these surveys, risk of exposure to sea turtles is considered minimal. Likewise, geotechnical surveys, which may introduce low-level, intermittent, broadband noise into the marine environment, are unlikely to result in behavioral disturbance given their low source levels and intermittent use. Impacts from G&G surveys from one NY Bight project on sea turtles are therefore expected to be minor, with effects that are of low intensity and detectable but that do not lead to population-level impacts.

G&G surveys may occur irregularly throughout the O&M phase of one NY Bight project to check the integrity of the scour protection around the foundations and ensure the interarray and export cables have not become exposed. The scope of G&G surveys during O&M would be similar to that described for one NY Bight project construction and impacts on all sea turtles would similarly be detectable and minor, with no population-level effects.

Unexploded Ordnance Detonations

As discussed in Section 3.5.7.3.3 and Appendix J, underwater explosions of this type generate high pressure levels that could cause disturbance and both non-auditory and auditory injury to sea turtles. Five UXO locations (shown in Section 3.6.7, *Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research and Surveys*, on Figure 3.6.7-6) and two UXO areas are located within the NY Bight area (Ecology and Environment 2017). While avoidance and non-explosive methods would be preferred and may be employed to lift and move these objects, it may not be possible to avoid all UXOs and some may need to be removed by explosive detonation. Based on acoustic modeling conducted for a nearby wind farm (Ocean Wind 1 OCS-A 0498), the physical range in which detonation of a UXO may exceed the mortality threshold for sea turtles resulting from a UXO at 39-, 66-, 98-, 148-foot (12-, 20-, 30-, and 45-meter) water depths may extend up to 1,903 feet (580 meters) from the source depending on the sea turtle size and location of the detonation (Hannay and Zykov 2022). Modeling included a range of UXO masses from 5 to 1,000 pounds (2.3 to 454 kilograms) based on charge weight "bins" defined by the U.S. Navy (Hannay and Zykov 2022). Modeled distances to non-auditory injury (e.g., gastrointestinal injury, lung injury) thresholds for these UXO masses and depths may extend up to 3,451 feet (1,052 meters) and distances to the PTS threshold may exceed 4,134 feet (1,260 meters) (Hannay and Zykov 2022). Modeled distances to the TTS threshold (which is used to determine potential behavioral disturbances for single detonations) for these UXO masses and depths may extend up to 15,997 feet (4,870 meters) (Hannay and Zykov 2022). The physical range at which injury or mortality could occur will vary based on the amount of explosive material in the UXO, size of the animal, the location of the animal relative to the explosive, whether the UXO is buried, the water depth of the blast, and local seafloor conditions, among other factors. Although acoustic modeling was not conducted for one NY Bight project, the ranges presented above from Hannay and Zykov (2022) are used to approximate the potential risk in this PEIS as the model was conducted for a comparable region in the northeastern United States, which is also likely to encounter similar types of UXO. UXO detonation is anticipated to be infrequent, localized, and temporary as detonation is not the preferred method of removal for any anticipated project. However, given the large ranges to auditory and non-auditory injury, the risk for mortality, and the severity of consequences to an exposed individual, impacts due to an unmitigated UXO detonation would be moderate for sea turtles because this could result in the loss of individuals, but populations would be expected to recover after construction of one NY Bight project.

Impact and Vibratory Pile-Driving

Noise from impact and vibratory pile-driving for the installation of WTG and OSS monopile or jacket foundations would occur intermittently during the installation of offshore structures. Impact pile-driving is anticipated to be used for monopiles and piled jacket foundations; vibratory impact pile-driving would likely only be used for piled jacket foundations. Maximum hammer energy for impact pile-driving is assumed to be less than 5,000 kJ with an estimated duration of up to 4 hours per day. Vibratory pile-driving is predicted to occur over a 1-hour period. If suction bucket or gravity-based foundations are used, no pile-driving would be required; therefore, no impact or vibratory pile-driving noise impacts would occur.

Noise produced by impact pile-driving during installation of WTG and OSS foundations have the potential to result in PTS and behavioral disturbances for all sea turtle species. Although acoustic modeling is not available for one NY Bight project activities, unmitigated ranges to the PTS thresholds for impact pile-driving may exceed 12,139 feet (3,700 meters) for the installation of one monopile per day based on acoustic modeling conducted for similar offshore wind project construction (Empire 2022; Küsel et al. 2022a,b; Tetra Tech 2022). Ranges to the behavioral disturbance threshold for sea turtles may extend to distances from 6,562 to 16,404 feet (2,000 to 5,000 meters) for large-diameter monopile foundations measuring between 30 and 49 feet (9 and 15 meters), which are the foundation type likely to result in the greatest potential for acoustic impacts, depending on the location (Empire 2022; Küsel et al. 2022a,b; Tetra Tech 2022). Vibratory pile-driving is not likely to result in PTS or behavioral disturbance for any species considering threshold ranges are predicted to be very small, extending <164 feet (<50 meters) for PTS thresholds and <656 feet (<200 meters) for behavioral thresholds (Tetra Tech 2022).

Glauconite sands may be present in the NY Bight lease areas. Depending on the classification of the glauconite sands present, there can be challenges associated with potential offshore wind development in these areas. Specifically, some glauconite sands are difficult, or even impossible, to drill through and cause high friction and increased noise during pile-driving. If developers discover glauconite sands during construction and installation, noise levels will likely increase as they determine if the glauconite is passable.

Behavioral and masking effects are more difficult to mitigate with large threshold ranges and are considered likely during impact pile-driving. One NY Bight project includes installation of up to 280 WTG and up to 5 OSS, which would equate to up to 285 days of impact pile-driving (assuming one monopile installation per day). Avoidance of impulsive noise sources by sea turtles has also been inferred from field observations of sea turtle behavior during seismic surveys (DeRuiter and Doukara 2012; Holst et al. 2006; Weir 2007), and other responses include short-term displacement of feeding or migratory activity (NSF and USGS 2011; Samuel et al. 2005). Though sea turtles may temporarily avoid the area, behaviors would be expected to return to normal after construction, and no long-term impacts that would affect stock or population viability are expected.

Impacts from impact pile-driving would be moderate, with effects that are measurable and detectable, but any potential injuries would only affect individuals and would not affect population viability. Impact from vibratory pile-driving would be minor for sea turtles as effects are anticipated to be low intensity, short term, and localized.

Vessels

As discussed in Section 3.5.7.3.3, underwater noise levels produced by construction and maintenance vessels throughout the life of the project are not expected to exceed PTS thresholds for sea turtles given the relatively low noise levels produced. However, sea turtles would be able to detect construction and support vessels associated with one NY Bight project, which could elicit behavioral changes in individual sea turtles present in the project area during vessel operations, but these changes would be limited to evasive maneuvers such as diving, changes in swimming direction, or changes in swimming speed. These changes are not expected to be biologically notable, and impacts on sea turtles from one NY Bight project vessel noise would therefore be minor as population-level effects are not anticipated.

Vessel traffic during the O&M phase of one NY Bight project is expected to be infrequent and limited to the use of smaller vessels which would limit the level of noise produced during maintenance trips and G&G surveys. Given the lower volume of vessel traffic expected during O&M and the smaller size of the vessels expected, impacts on all sea turtles are expected to be barely measurable and, therefore, negligible.

Dredging, Trenching, and Cable-Laying

During one NY Bight project construction, jetting, plowing, or removal of soft sediments may be required prior to installation of the WTGs and OSSs and installation of the interarray cable and export cable. As described in Section 3.5.7.3, these activities may result in behavioral disturbances for some sea turtles, though these are expected to be low-intensity and localized (Heinis et al. 2013). Additionally, because activities associated with one NY Bight project are expected to be short term and localized, impacts on all sea turtles from dredging or trenching noise during cable-laying would be expected to be negligible, with no perceptible consequences to populations.

Drilling

Drilling activities may be used during installation of the WTG foundations in the unlikely event that a pile has been “driven to refusal,” which occurs when five or more blows of an adequate hammer will not budge the pile. Drilling would be used for removal of soils, boulders, or other obstructions from the pile to ensure the foundation is safely and securely installed in the seabed. Drilling activities may produce SPL of 140 dB re μPa at 3,280 feet (1,000 meters) (Austin et al. 2018). This would exceed the continuous noise threshold of 120 dB re 1 μPa beyond 3,280 feet (1,000 meters), but these events are expected to be short term and would not be required for every foundation installed for one NY Bight project, which limits the risk of sea turtles potentially present during construction. While behavioral responses may occur from drilling, they are expected to be short term and of low intensity. Impacts from potential drilling activities on all sea turtles would therefore be minor, as the potential behavioral responses may be detectable, but population-level effects are not anticipated.

Aircraft

Aircraft used during one NY Bight project construction would follow established guidance (BOEM 2019) and would maintain altitudes of 1,000 feet (305 meters) or more above the water surface during normal flight operations, exclusive of takeoffs and landings. As discussed in Section 3.5.7.3.3, there is limited information regarding sea turtle responses to airborne aircraft noise. Based on available information, it is expected that short-term, non-biologically notable behavioral responses may occur (BOEM 2017; NSF and USCG 2011; Samuel et al. 2005). These changes in behavior are expected to end when the aircraft has left the area. Consequently, potential effects on sea turtles from aircraft noise for one NY Bight project are expected to be negligible, with no perceptible consequences to populations.

WTG Operations

As discussed in Section 3.5.7.3.3, operations of the WTG would result in long-term, low-level, continuous noise in the one NY Bight project area, which could result in behavioral disturbances and auditory masking at close distances (Lucke et al. 2007; Tougaard et al. 2009, 2020; Thomsen and Stober 2022). Noise produced by operational WTGs is within the auditory hearing range for all sea turtles, but the potential for impacts is not likely to occur outside a relatively small radius surrounding the project foundations and the audibility of the WTGs may be further limited by the ambient noise conditions of the one NY Bight project area (Jansen and Jong 2016, as an example). Impacts on sea turtles would therefore be minor as the behavioral responses would be detectable but would not be expected to result in any population-level effects.

Port utilization: Use of the port facilities located in New York and New Jersey would increase vessel traffic in the area and potentially require expansion or increased maintenance of port facilities within the sea turtle geographic analysis area. Expansion could result in impacts on coastal and estuarine habitats from shoreline noise during construction and disturbance or loss of habitat for prey species. As discussed in Section 3.5.7.3.3, there are a number of dredging and port improvement activities either planned or considered reasonably foreseeable at the representative ports identified for potential use by any of the NY Bight projects (Section D.2.5, Appendix D). Representative ports in New York and New Jersey include the Port of Albany, Port of Coeymans, Brooklyn Navy Yard, South Brooklyn Marine Terminal, Howland Hook/Port Ivory, Arthur Kill Terminal, Paulsboro Marine Terminal, and New Jersey Wind Port (Section D.2.5, Appendix D).

Increased maintenance such as dredging could expose sea turtles to increased levels of underwater noise, increased turbidity, and entrainment risk, affecting individual sea turtles or their prey. Increased activities associated with port expansion and port maintenance would likely be intermittent but long term. Increased noise associated with dredging was discussed previously under the *Noise* IPF, and vessel traffic associated with the above specified ports is covered in the *Traffic* IPF section. However, as discussed in Section 3.5.7.3.3, most dredging impacts on sea turtles were associated with hopper dredging in the southeastern United States and Gulf of Mexico (Michel et al. 2013; USACE 2020) used for dredging projects that have a much larger scope than what would be associated with one NY Bight project, so any port expansion activities associated with offshore wind projects would have a lower risk of effect on sea turtles. Additionally, most sea turtles occurring in the area would be migrating or foraging offshore, and while one species has been documented nesting in New York, this is considered a rare occurrence and is not common within the NY Bight area (Section 3.5.7.1). Therefore, dredging impacts on sea turtles from port utilization during one NY Bight project construction would be negligible as no perceptible consequences to populations are anticipated.

Port activities beyond routine maintenance of the facilities are not predicted at this time. Therefore, port utilization during the construction and O&M phase of one NY Bight project is likely to have negligible impacts on sea turtles as there would be no perceptible consequences to individuals or populations. Vessel traffic in and out of the ports is considered in the *Traffic* IPF.

Presence of structures: Under one NY Bight project, up to 280 WTGs, up to five OSSs, and new hard scour/cable protection would be installed. The structures and scour/cable protection, and the potential consequential impacts, would remain at least until conceptual decommissioning of the facility is complete. The foundations would be placed in a grid-like pattern with a minimum spacing of 0.6 by 0.6 nautical mile (1.1 by 1.1 kilometers) between WTGs. Based on the space between turbines, one NY Bight project would not present a barrier to movement to sea turtles, and the presence of WTG foundations would pose a negligible risk of displacement effects on sea turtles.

Long-term reef and hydrodynamic effects resulting from one NY Bight project could result in beneficial effects on sea turtles that benefit from increased prey abundance around the structures. However, these beneficial impacts would be reversed following project decommissioning when all project structures would be removed. The decision to remove structures or to leave them in place would be a part of the decommissioning application submitted to BSEE and approved or disapproved by BOEM at the project-specific stage. Conversely, minor impacts due to disruption in hydrodynamics from one NY Bight project could result in impacts on sea turtles that forage on planktonic species such as jellyfish. Sea turtles may also use vertical structures from one NY Bight project for shelter from strong currents to conserve energy and for cleaning their carapace (Barnette 2017). Long-term impacts could occur as a result of increased interaction with active or abandoned fishing gear. This impact is considered minor for sea turtles.

The presence of structures may concentrate recreational fishing around foundations and would also increase the risk of gear loss or damage. This could cause entanglement, especially with monofilament line, and increase the potential for entanglement in both lines and nets leading to injury and mortality due to abrasions, loss of limbs, and increased drag, resulting in reduced foraging efficiency and ability to avoid predators (Barnette 2017; Berreiros and Raykov 2014; Foley et al. 2008). The reef effect may attract recreational fishing effort from inshore areas and attract sea turtles for foraging opportunities, resulting in a small increased risk of sea turtle entanglement and hooking or ingestion of marine debris where fishing activity and turtles are concentrated around the same foundations. Therefore, though the increase in prey availability around the structures may result in long-term benefit for sea turtles, the risk of increased interactions with active or abandoned fishing gear would result in moderate impacts on sea turtles, as impacts on or loss of individuals may occur, but populations are expected to sufficiently recover.

Traffic: A number of vessels will be required to support activities carried out during the construction and installation, O&M, and conceptual decommissioning phases of one NY Bight project. Vessel traffic would be present for surveying activities; foundation, OSS, cable, and WTG installation; and support activities. The majority of the vessels are expected to have conventional propeller- or thruster-based propulsion systems. Smaller vessels designed primarily for crew transfer applications are expected to employ conventional propeller-propulsion systems or water jet-drive-based systems.

It is estimated that one NY Bight project would generate approximately 51 vessels operating in the one NY Bight project area at any one time during the construction and installation phase and approximately the same number of vessel trips per year during conceptual decommissioning as during construction and installation; the O&M phase would result in 8 trips per day primarily from ports identified in the *Port utilization* IPF to the project area (Section 3.6.6, *Navigation and Vessel Traffic*). Crew transfer vessels would account for a majority of vessel types used during O&M followed by supply vessels and jack-up vessels.

The potential effect of a vessel strike on sea turtle populations is considered severe in intensity because potential receptors include listed species and because the NY Bight area and potential vessel transit routes seasonally or annually support sea turtles. The geographic extent is considered localized to the vessel transit routes and the project area. Vessel traffic may also occur after dark or in daylight during periods of poor visibility (e.g., fog) or inclement weather conditions, during which risk of collisions with sea turtles would be higher because both turbid water and darkness would impede turtles' visual detection of approaching boats. Additionally, sea turtles spend time near the surface while resting, feeding, or periodically surfacing to breathe, during which time they would be more susceptible to vessel strikes. Data from Watwood and Buonantony (2012) and Borcuk et al. (2017) suggest loggerhead and green sea turtles spend 60 to 75 percent of the time within 32 feet (10 meters) of the surface and leatherback sea turtles spend about 20 percent of the time within 32 feet (10 meters) of the water surface; there are insufficient data to quantify Kemp's ridley sea turtle activity.

As one NY Bight project vessels would operate throughout the construction and installation, O&M, and conceptual decommissioning phases, the potential for a vessel to strike a sea turtle is considered continuous (life of one NY Bight project). Effects from vessel strikes range from short term in duration for minor injuries to permanent in the case of death of an animal. This impact is considered minor for sea turtles as there is potential for mortality or serious injury to occur to individuals, but it would not affect the viability of any sea turtle populations.

Survey gear utilization: There is currently no specific information regarding biological or fisheries monitoring surveys for one NY Bight project to quantitatively assess in this PEIS. However, unintended capture in fishing gear is a primary threat to sea turtles and is therefore included in this analysis. Sea turtles have the potential to be caught in trawl gear, longlines, gillnets, hook and line, pound nets, pot/traps, and dredge fishing gear. As discussed in Sections 3.5.7.1 and 3.5.7.3.3, impacts of entanglement from fishing gear could occur to all species in the NY Bight area. However, given the relatively limited extent and duration of these surveys, impacts on individuals would be detectable and measurable, but would not lead to population-level effects. The impact of survey gear utilization on sea turtles as a result of one NY Bight project, therefore, is expected to be minor.

Lighting: One NY Bight project would introduce mobile and stationary artificial light sources to the lease area that would persist from dusk to dawn. Artificial light in coastal environments is an established stressor for juvenile sea turtles, which use light to aid in navigation and dispersal and can become disoriented when exposed to artificial lighting sources, but the significance of artificial light in offshore environments is less clear (Gless et al. 2008). Available data suggests that there is the potential for effects on sea turtle species as a result of artificial lighting. While these effects would be localized and limited to the area exposed to operational lights, the effects would persist over the lifetime of the project. Orr et al. (2013) indicate that lights on wind generators flash intermittently for navigation or safety purposes and do not present a continuous light source. Limpus (2006) suggested that intermittent flashing lights with a very short “on” pulse and long “off” interval are non-disruptive to sea turtle behavior, irrespective of the color. Similarly, navigation/anchor lights on top of vessel masts are unlikely to adversely affect sea turtles (Limpus 2006). Orr et al. (2013) summarized available research on potential operational lighting effects from offshore wind energy facilities and concluded that the operational lighting effects on sea turtle distribution, behavior, and habitat use were unknown but likely negligible when recommended design and operating practices are implemented. Therefore, the impact of artificial lighting on sea turtles as a result of one NY Bight project is expected to be negligible.

3.5.7.4.2 *Impacts of Six Projects*

The same IPF impact types and mechanisms described under one project apply to six projects developed for the NY Bight. There would be more potential for impacts for these IPFs due to the greater amount of offshore and onshore development under six NY Bight projects. Impacts for accidental releases, discharges/intakes, EMFs and cable heat, survey gear utilization, and lighting are expected to be the same as those discussed above for one NY Bight project. These IPFs from six projects would not result in combined effects due to the highly localized nature of the individual IPFs, the low probability of any effects for even one project, and no population-level consequences for sea turtles. While individual projects vary in size and individual IPFs for each project may vary, the overall likelihood of impacts resulting from these IPFs for any one project remains the same as described in Section 3.5.7.4.1 regardless of the number of NY Bight projects considered. IPFs that will have a greater potential for impact under six NY Bight projects include cable emplacement and maintenance, noise, port utilization, presence of structures, and traffic.

Cable emplacement and maintenance: Under six NY Bight projects, the total area of seafloor disturbance would increase due to the substantial increase in the number of cables installed and maintained in the NY Bight area. Additionally, construction of six NY Bight projects would increase the amount of dredging equipment and activities used during installation of the cables. As discussed in Sections 3.5.7.3.3 and 3.5.7.4.1, direct impacts from dredging, particularly entrainment, typically result in severe injury or mortality for sea turtles (Dickerson et al. 2004; NMFS 2020). However, the risk of interactions between hopper dredges and individual sea turtles is expected to be lower in the open ocean areas where six NY Bight project cables would likely be installed compared to nearshore navigational channels where sea turtles are more concentrated in a constrained operating environment (Michel et al. 2013; NMFS 2020). The risk of entrainment in dredging associated with cable emplacement for six NY Bight projects would be measurable but impacts would be localized and minor for sea turtles as no population-level effects would occur.

Noise: Under six NY Bight projects, noise generated from impact pile-driving will increase due to the substantial increase in the number of foundations to be installed in the NY Bight area. If the construction of six NY Bight projects does not occur simultaneously, the total sound entering the water column at any given time would approximate that described for one NY Bight project (see *Noise* IPF). However, if construction occurs simultaneously on all six NY Bight projects, this would greatly increase the ensonified region. The impact on sea turtles, however, would remain moderate as PTS cannot be ruled out. The risk to sea turtles from UXO detonations will also increase under six NY Bight projects given the increased area over which UXOs may be encountered that cannot be avoided; the impact, however, will remain the same as for one NY Bight project and is expected to be moderate for sea turtles given the high-consequence severity of this IPF regardless of the number of detonations anticipated. Given the expected substantial increase in vessels operating under six NY Bight projects, impacts on sea turtles due to vessel noise would be elevated to minor for all phases (construction and installation, O&M, conceptual decommissioning), with effects that are detectable and measurable under full buildout of six NY Bight projects but would not lead to population-level effects. The impact on sea turtles from WTG operations under six NY Bight projects would elevate to minor for sea turtles due to potential long-term, localized presence in low-frequency noise that would be restricted to a small radius around each WTG. The impact of six NY Bight projects from all other noise sources (G&G surveys, aircraft, cable laying/trenching, and drilling) would increase marginally, but because the area of effect would also be limited to a relatively small area around the activity for six NY Bight projects, the full build out of projects is not expected to result in prolonged behavioral disturbances that would affect foraging or reproduction for any species, and would not elevate to higher impact levels as compared to one NY Bight project.

Within a concurrent exposure scenario of multiple wind farms under construction, an individual sea turtle in the area has the potential to be exposed to the sounds from more than one pile-driving event within a given season if traveling through more than one lease area during impact pile-driving. However, results from a previous risk assessment for marine mammals conducted for three projects offshore New England showed that concurrent construction of multiple wind farms could in fact minimize the overall risk to sea turtles by reducing the overall duration of impact pile-driving noise present within the NY Bight area (Southall et al. 2021). Therefore, the risk of noise effects on sea turtles is not expected to significantly increase from the construction of six NY Bight projects compared to one project, but the risk of effects of exposure to noise above acoustic thresholds during impact pile-driving cannot be ruled out. This would result in a moderate impact rating for pile-driving for all sea turtles.

Port utilization: Similar to the discussion for cable emplacement and maintenance under six NY Bight projects scenario, port utilization under six NY Bight projects would also increase. This would increase the likelihood of dredging projects occurring that could present the risk of entrainment for sea turtles. With the increase in the number and spatial extent of ports needed to support six NY Bight projects, impacts from potential dredging would be elevated to minor for sea turtles as impacts on individuals would be detectable and measurable, but would not lead to population-level consequences.

Presence of structures: Under six projects, the number of structures in the NY Bight area would be substantially higher than that for one NY Bight project. As a result, the presence of structures IPF has the potential to be more impactful to sea turtles under six NY Bight projects, mainly due to the increased risk of entanglement associated with additional vertical structures in the water column. Sea turtles would be at an increased risk of entanglement and may experience long-term consequences; impacts, however, are expected to remain moderate as effects would be detectable and measurable, though the viability of the species is likely to remain functional or are able to sufficiently recover. Minor beneficial impacts will likely still result due to the reef effect and potential increase in foraging opportunity, which would be measurable, though localized, and may be offset given the increased risk of entanglement due to derelict fishing gear on the structures.

Traffic: The construction of six NY Bight projects will substantially increase the number of vessels operating in the NY Bight area throughout all six NY Bight project phases. This increase in vessel traffic will increase the impact on all sea turtles from minor under one NY Bight project to moderate under six NY Bight projects because the consequences would be detectable and long-term for individuals, but populations are expected to remain viable.

3.5.7.4.3 Impacts of Alternative B on ESA-Listed Species

General impacts of Alternative B on sea turtles were described in the previous subsection. Because all sea turtle species present in the NY Bight area are listed under the ESA, the impact determinations provided in the previous subsections would apply here.

3.5.7.4.4 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of infrastructure for planned non-offshore-wind and planned offshore wind activities across the geographic analysis area would contribute to the primary IPFs of accidental releases, discharges/intakes, cable emplacement and maintenance, electric and magnetic fields and cable heat, noise, port utilization, presence of structures, traffic, and survey gear utilization.

Accidental releases: In the context of ongoing and planned non-offshore-wind and offshore wind activities, the impact contributed by accidental releases from six NY Bight projects would be undetectable. Impacts, therefore, are expected to be temporary and highly localized due to the likely limited extent and duration of a release, resulting in minor impacts for sea turtles, largely driven by ongoing and planned non-offshore-wind activities.

Cable emplacement and maintenance: In the context of reasonably foreseeable environmental trends, the contributions of six NY Bight projects to the combined cable emplacement impacts associated with planned non-offshore-wind and planned offshore wind activities would be undetectable on sea turtles. Impacts are expected to be minor, with short-term, localized consequences to individuals that are detectable and measurable but do not lead to population-level effects.

Discharges/intakes: In the context of reasonably foreseeable environmental trends, the contributions of six NY Bight projects to the combined discharge and intake impacts associated with planned non-offshore-wind and planned offshore wind activities would be undetectable. Impacts, therefore, are expected to be low in intensity, highly localized, and non-measurable, resulting in negligible impacts for sea turtles.

Electric and magnetic fields and cable heat: In the context of reasonably foreseeable environmental trends, the impact contributed by six NY Bight projects, while difficult to detect, would result in a cumulative increase in EMFs in the geographic analysis area beyond that described under the No Action Alternative. However, the combined impacts from EMFs and cable heat on sea turtles would likely still be negligible, localized, and long-term though with no perceptible consequences to individuals or populations.

Noise: In the context of reasonably foreseeable environmental trends, the contributions of six NY Bight projects to the combined noise impacts associated with planned non-offshore-wind and planned offshore wind activities described for Alternative A in Section 3.5.7.3.3 would be noticeable. The most significant sources of noise are expected to be pile-driving and UXO detonation. Impacts from impact pile-driving and UXO detonation would be moderate for all sea turtles due to the potential for severe-intensity effects such as non-auditory injury, but populations would be expected to fully recover. Impacts from vibratory pile-driving, G&G surveys, vessel noise, foundation drilling, and WTG operations would be minor for all sea turtles as impacts would be detectable and measurable but would not lead to population-level effects. Impacts from aircrafts and dredging, trenching, and cable-laying would be negligible for all sea turtles as impacts on individuals would be barely perceptible, short term, and highly localized.

Port utilization: In the context of ongoing and planned non-offshore-wind and offshore wind activities, the impact contributed by six NY Bight projects would result in a noticeable increase in port utilization in the geographic analysis area beyond that described under the No Action Alternative. The cumulative impacts of port utilization would therefore be minor, as impacts on sea turtles are expected to be detectable, but highly localized and intermittent; population-level impacts would not be expected.

Presence of structures: In the context of ongoing and planned non-offshore-wind and offshore wind activities, the impact contributed by six NY Bight projects would result in a noticeable increase in the presence of structures in the geographic analysis area beyond that described under the No Action Alternative. However, the combined impacts from the presence of structures would likely still be moderate for sea turtles, largely due to the risk of secondary entanglement in lost fishing gear, but population-level impacts are not expected. Minor beneficial impacts may result for sea turtles as well due to the reef effect and potential increase in foraging opportunity.

Traffic: In the context of ongoing and planned non-offshore-wind and offshore wind activities, the impact contributed by six NY Bight projects would result in a noticeable increase in vessel traffic in the geographic analysis area. The combined impact would be moderate for sea turtles because vessel strike would result in long-term consequences to individuals that are detectable and measurable but would not affect the viability of any sea turtle populations.

Survey gear utilization: In the context of ongoing and planned non-offshore-wind and offshore wind activities, the impact contributed by six NY Bight projects would be undetectable. Impacts, therefore, are expected to be minor, with short-term, localized consequences to individuals that are detectable and measurable but do not lead to population-level effects.

Lighting: In the context of ongoing and planned non-offshore-wind and offshore wind activities, the impact contributed by six NY Bight projects would result in a noticeable increase in artificial lighting in the geographic analysis area beyond that described under the No Action Alternative. However, the combined impacts from lighting would likely remain negligible for sea turtles, largely due to the limited potential for impacts, if any, and the localized and temporary impacts; although impacts on individuals would be detectable and measurable, no population-levels effects are expected.

3.5.7.4.5 Conclusions

Impacts of Alternative B. Construction and installation, O&M, and conceptual decommissioning of either one or six NY Bight projects, would result in habitat disturbance (presence of structures and new cable emplacement), habitat conversion (presence of structures), underwater and airborne noise, vessel traffic (strikes and noise), and potential discharges/spills and trash under Alternative B. For both one and six NY Bight projects, BOEM expects individual impacts ranging from **negligible** to **moderate** for sea turtles because impacts from most IPFs would likely be noticeable and measurable but would not affect the continued viability of any sea turtle populations. Impacts are expected to result mainly from pile-driving noise, UXO detonations, increased vessel traffic, and the presence of structures related to fishing gear entanglement. **Minor beneficial** impacts for sea turtles are expected to result from the presence of structures primarily due to an increase in foraging opportunity as a result of the artificial reef effect for both one and six NY Bight projects, which may be offset given the increased risk of entanglement due to derelict fishing gear on the structures.

Cumulative Impacts of Alternative B. BOEM anticipates that the cumulative impacts on sea turtles in the geographic analysis area under six NY Bight projects would likely be **negligible** to **moderate** for sea turtles and could include **minor beneficial** impacts. Long-term effects may occur for individual sea turtles, primarily due to UXO detonations, pile-driving noise, vessel traffic, and entanglement risk associated with the presence of structures, but impacts would be recoverable and would not affect the viability of the populations. In the context of other reasonably foreseeable environmental trends, impacts contributed by six NY Bight projects to the cumulative impact on sea turtles would range from undetectable to appreciable. Six NY Bight projects would contribute to the cumulative impacts primarily through pile-driving noise, increased vessel traffic, and the presence of structures as related to fishing gear entanglement.

3.5.7.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Sea Turtles

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight Area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives—Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.5.7.5.1 Sub-Alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has previously required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS and through related consultations (Table 3.5.7-8).

Table 3.5.7-8. Summary of previously applied avoidance, minimization, mitigation, and monitoring measures for sea turtles

Measure ID	Measure Summary
MMST-1	This measure proposes requiring submittal and approval of a Reduced Visibility Monitoring (RVMP)/Nighttime Pile Driving Monitoring Plan to ensure visual monitoring can be achieved.
MMST-2	This measure proposes requiring the submittal and approval of a final pile-driving Marine Mammal and Sea Turtle monitoring plan with PAM and PSO requirements.
MMST-3	This measure proposes adjusting pile-driving clearance zones, shutdown zones, and monitoring and mitigation measures for pile driving based on sound field verification measurements.
MMST-4	This measure proposes requiring time of day restrictions, PSOs, clearance, and shutdown zones for pile-driving activities to reduce impacts from noise.
MMST-5	This measure proposes requiring additional PSO coverage to reliably monitor expanded pile driving clearance or shutdown zones to reduce noise impacts on marine mammals and sea turtles.
MMST-6	This measure proposes requiring that PSOs have effective viewing conditions (e.g., rain, fog, darkness) for visual monitoring during pile-driving to ensure unobstructed visual monitoring.
MMST-7	This measure proposes requiring that PSO coverage and training requirements for pile driving are sufficient to detect protected species.
MMST-9	This measure proposes requiring vessel crew and PSO training for protected species identification to reduce vessel strike risk.
MMST-10	This measure proposes requiring PSO reporting of all protected species in the shutdown zone during active pile driving.
MMST-12	This measure proposes requiring clearance and shutdown zones and related mitigations for marine mammals and sea turtles during geophysical surveys.
MMST-14	This measure proposes requiring that vessel operators and crews maintain a watch for protected species and take mitigative action if sighted to reduce vessel strike risk.
MUL-1	This measure proposes requiring training, recovery, prevention, and reporting to reduce and eliminate trash and debris in order to reduce impacts from entanglement, ingestion, smothering of protected species (including marine mammals, sea turtles, and benthic species), and pollutants in the water column. This measure also proposes requiring surveys to monitor and adaptively mitigate for lost fishing gear accumulated at WTG foundations.
MUL-8	This measure proposes requiring that all trap/pot gear used in fishery surveys would be uniquely marked to distinguish it from commercial or recreational gear and to facilitate identification of gear on any entangled marine mammals, sea turtles, or ESA-listed fish.
MUL-9	This measure proposes requiring recovery and reporting of any lost fishery and benthic monitoring survey gear to reduce entanglement impacts on marine mammals, sea turtles, and ESA-listed fish.
MUL-10d	This measure proposes requiring qualified third-party PSOs to observe Clearance and Shutdown Zones and implement mitigation measures during data collection and site survey activities.
MUL-10e	This measure proposes PSO reporting requirements during site-characterization and site assessment/data collection activities
MUL-13	This measure proposes requiring use of trained observers onboard trawl and trap surveys to mitigate impacts on protected species, including marine mammals, sea turtles, and fish.
MUL-14a	This measure proposes developing and implementing standard protocols for addressing UXOs. Avoidance to the maximum extent practicable is required; a plan must be submitted if avoidance is not possible.
MUL-16	This measure proposes development and implementation of a plan for post-storm event monitoring of facility infrastructure, foundation scour protection, and cables. BSEE reserves the

Measure ID	Measure Summary
	right to require post-storm mitigations to address conditions that could result in safety risks and/or impacts to the environment.
MUL-19	This measure proposes requiring inspecting the cables after installation to determine location, burial, and conditions of the cable and surrounding areas and implementing remedial actions if needed.
MUL-20	This measure proposes requiring implementation of soft start techniques during impact pile-driving to reduce noise impacts on marine mammals, sea turtles, and finfish.
MUL-29	This measure proposes requiring pile-driving sound field verification, a written plan to inform the size of the isopleths for potential injury and harassment, and reporting requirements.
MUL-31	This measure proposes that all fisheries sampling gear is hauled out every 30 days and between seasons to minimize entanglement risk.
MUL-32	This measure outlines PSO reporting requirements (including foundation pile driving).
MUL-33	This measure proposes requiring communication of protected species sightings and detections amongst all project vessels.
MUL-34	This measure proposes requiring reporting of any observations or collections of injured or dead protected species.
MUL-37	This measure proposes requiring use of FAA-approved lighting that will only become active if an aircraft is present in the vicinity of the wind farm to reduce visual impacts at night.
ST-3	This measure proposes requiring vessels deploying fixed fisheries survey gear be equipped with disentanglement equipment and follow Northeast Atlantic Coast STDN Disentanglement Guidelines to reduce impacts on sea turtles from entanglement.
STF-2	This measure proposes requiring identification, data collection, handling, and resuscitation measures for sea turtles and Atlantic sturgeon caught and retrieved in fisheries survey gear to minimize impacts from entanglement.
STF-4	This measure proposes requiring reporting of any potential takes of sea turtles and Atlantic sturgeon during fisheries surveys.

Impacts of One Project

As compared to under Alternative B, implementation of previously applied AMMM measures would reduce impacts on sea turtles for IPFs, including accidental releases, cable emplacement and maintenance, EMF and cable heat, noise, presence of structures, traffic, survey gear utilization, and lighting. Impacts for other IPFs would remain the same as described under Alternative B.

BOEM-proposed mitigation, monitoring, and reporting measures derived from BOEM's *Data Collection and Site Survey Activities for Renewable Energy on the Atlantic OCS* Biological Assessment (Baker and Howsen 2021) and presented in BOEM's *Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection* notice (last revised on November 22, 2021) (BOEM 2021) are required under Lease issuance, and are therefore considered standard for preconstruction activities. These measures are primarily related to reducing impacts on sea turtles from G&G survey equipment and vessel traffic during site assessment surveys. Measures that are or will soon be required by federal law, such as USCG discharge rules and the pending NMFS NARW speed rule, are requirements for all vessel operators and not limited to offshore wind or project-specific activities; these measures are accounted for in both Alternative B and Sub-alternative C1 analyses. AMMM measures that are specific to a given IPF or IPFs from Table 3.5.7-8 are discussed further below, except those that are limited to required reporting procedures, which are not expected to reduce expected impacts on sea turtles and therefore are not considered further in this analysis.

Accidental releases: Potential impacts on sea turtles from accidental releases may decrease under Sub-alternative C1 compared to Alternative B. AMMM measure MUL-1 would require standardized marine debris awareness training for project personnel, proper marking and stowage of all materials, equipment, tools and containers, and recovery for all discarded or lost items to the extent practicable. MUL-1 would also require marine debris monitoring around WTG foundations. Additionally, MUL-9, which requires the recovery of lost survey gear, would reduce the amount of marine debris that is in the water as a result of project activities and infrastructure. Implementation of these waste management and mitigation measures, as well as marine debris awareness training, would reduce the likelihood of an accidental release. The impact of accidental releases and discharges under Sub-alternative C1 would be reduced from minor as in Alternative B, to negligible for sea turtles and would be low intensity, short term, and localized and not lead to population-level consequences.

Cable emplacement and maintenance: Potential impacts on sea turtles from cable emplacement and maintenance activities, primarily through increased turbidity in the water column, may be decreased under Sub-alternative C1 compared to Alternative B. AMMM measure MUL-19, which proposes inspection of the cables during operations and implementing remedial actions if needed, could help reduce the potential effects of cable maintenance during operations if additional mitigation measures are deemed necessary. Overall, these measures would only be expected to provide a nominal reduction in potential turbidity effects on sea turtles, and potential impacts are, therefore, not expected to differ under Sub-alternative C1 compared to Alternative B (i.e., negligible).

Electric and magnetic fields and cable heat: AMMM measure MUL-19 would require periodic post-installation cable monitoring. While this measure may identify areas where project HVAC or HVDC cables are exposed on the seabed, it is not anticipated to reduce the level of impact of this IPF on sea turtles compared to Alternative B. The G&G survey efforts and vessel traffic needed to satisfy this AMMM measure could increase risk to sea turtles through both noise and traffic IPFs. However, this potential increase in risk is not anticipated to increase any IPF impact rating; thus, the impact expected on sea turtles remains negligible.

Noise: As discussed in Section 3.5.7.4.1, unmitigated noise has the potential to be highly impactful to sea turtles, especially that originating from UXO detonations and impact pile-driving. As a result, BOEM has developed several AMMM measures that are designed specifically to mitigate the sound exposure levels from impact pile-driving on sea turtles, thereby reducing the potential impact of this IPF.

PSO training, visual monitoring coverage, shutdown procedures, and monitoring equipment effectiveness, procedures, and protocols are critical to monitoring the defined clearance and shutdown zones during noise-generating activities (AMMM measures MMST-3, MMST-4, MMST-5, MMST-6, MMST-7, MMST-10, and MMST-12). These measures—namely those that establish clearance and exclusion zones—establish protocols to effectively monitor them by trained PSOs. Furthermore, the measures require shutdowns for sea turtles detected within these zones that will reduce the overall impact on sea turtles by reducing exposure to sound levels that can cause PTS. Reduction in PTS exposure would reduce the likelihood that a sea turtle is within range to experience these sound levels and would reduce the duration the sea turtle may be exposed to these sound levels.

An RVMP/Nighttime Pile Driving Monitoring Plan (MMST-1) must be prepared and submitted for agency review and approval. Additionally, MMST-2 requires the submittal of a pile-driving monitoring plan, which will need to be consistent with all monitoring and mitigation requirements.

Additionally, the pile-driving sound field measurement requirements proposed under AMMM measures MMST-2, MMST-3, and MUL-29 would confirm the predicted clearance and shutdown zones, adjust these zones or implement additional sound attenuation as needed, and require a pile-driving sound field verification plan to inform the size of the isopleths for potential injury and harassment, respectively. The clearance and exclusion zones will be based on the modeled threshold ranges, and the sound field measurements proposed under these AMMM measures will help ensure the proposed mitigation zones established in the AMMM measures listed previously effectively minimize the risk of PTS, if not eliminating it altogether.

Under Sub-alternative C1, AMMM measure MUL-29 would require the lessee to perform sound field verification of impact pile-driving noise levels during foundation installation. Pile-driving sound field measurement requirements proposed under AMMM measures MMST-3, MUL-22, and MUL-29 would confirm the predicted clearance and shutdown zones in the approved permits, enable adjustment of these zones (MMST-3), and require the lessee to implement additional sound attenuation as needed. Under this AMMM measure, the lessee would be required to prepare and submit for agency review and approval a sound field verification plan before commencement of pile-driving activities. This plan will identify key project parameters, the predicted clearance and shutdown zones, and the lessee’s approach for obtaining the sound field data. The clearance and exclusion zones will be based on the modeled threshold ranges, and the sound field measurements proposed under these AMMM measures will help ensure the proposed mitigation zones established in the AMMM measures effectively minimize the risk of PTS, if not eliminate it altogether.

Preparing and approving an RVMP/Nighttime Pile Driving Monitoring Plan (MMST-1) prior to construction for activities occurring at night or in low-visibility conditions will also ensure sufficient visual PSO coverage for monitoring the clearance and exclusion zones is achieved and implemented for all pile-driving activities. Seasonal restrictions (MMST-4) are primarily designed to avoid pile-driving activities during the period when NARW abundance in the project area is likely to be heightened, which, per this AMMM measure, occurs between January 1 and April 30. However, available data suggests that sea turtles present in the NY Bight area are most likely to occur between spring and fall (Section 3.5.7.1), which largely overlaps with the seasons of low NARW abundances. Therefore, sea turtles are less likely to benefit from this AMMM measure as increased abundances of these species are likely to occur during seasons when impact pile-driving would also occur. Finally, the greatest protections for sea turtles under MMST-4 would be through the implementation of clearance and exclusion zones to be monitored by trained PSOs as described above.

Soft-start procedures (MUL-20) can also be an effective mechanism to reduce the potential for PTS exposures in certain species during impact pile driving by deterring individuals from the ensonified area before the maximum hammer energy, and therefore the maximum sound levels, are reached. However, the efficacy of deterring sea turtle species through pile-driving soft-start procedures is unknown.

Consideration of all AMMM measures for impact pile driving of OSS and WTG foundations under Sub-alternative C1 is expected to reduce the potential impact of pile-driving noise on all sea turtles from the impacts under Alternative B. This would substantially reduce the impact of impact pile-driving to minor for all sea turtles. Impacts would be detectable and measurable, but will be of low intensity, highly localized, and short term in duration; population-level impacts are not anticipated under Sub-alternative C1.

AMMM measure MUL-14a is specifically designed for UXO detonations and proposes avoidance of underwater detonations to the maximum extent practicable and use of the best available technology to avoid or minimize exposure of protected resources to UXO detonations. Additionally, this measure requires consultation with all appropriate state and federal agencies to develop a plan for removal or detonation of a UXO if detonation is demonstrated to be necessary for the project.

The intensity of the effects from UXO detonation is expected to be reduced from severe to medium with the implementation of mitigation and monitoring measures that are applied to pile driving. These measures (PSOs, clearance and shutdown zones, and noise mitigation devices) are expected to limit impacts from extending beyond the immediate project area to a more localized extent that includes just the immediate project area. However, even with monitoring and mitigative measures, there could still be loss of individuals so the impact of UXO detonation would remain as moderate for all sea turtles, but no population-level impacts are anticipated under Sub-alternative C1.

AMMM measures for G&G surveys would include similar measures to those described for impact pile driving such as PSO training, visual monitoring coverage, shutdown procedures, and monitoring equipment effectiveness, procedures, and protocols (AMMM measures MMST-10 and MMST-12). However, under Alternative B (Section 3.5.7.4.1), the main impact from these surveys would be temporary behavioral disturbances, given the acoustic characteristics of these sources and extent of these surveys; the AMMM measures under Sub-alternative C1 would not reduce the impacts to the extent that they are not measurable. Therefore, impacts of G&G surveys would remain detectable and measurable but of low intensity, highly localized, and short-term and therefore minor for all sea turtles.

For noise-producing activities such as vessel operations, aircraft, cable laying or trenching, drilling, and WTG operations, there are no vessel noise-specific AMMM measures for these activities, and impacts under Sub-alternative C1 are unlikely to differ substantially from those under Alternative B (Section 3.5.7.4.1).

Additional discussion of the noise-related AMMM measures and how they may reduce noise impacts can be found in Appendix J.

Presence of structures: The primary impact on sea turtles associated with the presence of structures is due to entanglement risk resulting from an increased interaction with active or abandoned fishing gear. AMMM measures MUL-1, MUL-8, MUL-9, MUL-16, MUL-31, ST-3, ST-2, and STF-4 address this risk by providing guidance for gear use, and monitoring and adaptively mitigating recreational and commercial fishing gear that might be lost at sea. Monitoring and removing lost or derelict fishing gear will reduce exposure to such gear, therefore reducing the risk of entanglement to sea turtles. AMMM measure MUL-31 specifically requires all project-related sampling gear to be hauled at least once every 30 days and removed from the water between sampling seasons and MUL-9 requires the recovery of lost project-related survey gear which would help reduce the amount of gear caught on WTG foundations during O&M. Both measures are expected to reduce entanglement risk to sea turtles by minimizing exposure to and monitoring all survey gear periodically. While required gear marking (MUL-8) would not reduce entanglement risk directly, it would facilitate understanding which sampling gear is highest risk to sea turtles if multiple entanglements were to occur, which could be used to inform future deployments, ideally with minimized risk. BOEM would also require a monitoring plan be developed for post-storm events (MUL-16). While monitoring of cables (and cable protection) and WTG/OSS scour protection would not directly reduce effects on sea turtles, a monitoring plan would provide information about conditions that pose increased entanglement hazards from fishing gear (e.g., unburied cables), and BSEE would retain the ability to require post-storm mitigation to address safety risks and environmental impacts caused by the storm event. Based on these proposed AMMM measures, the impact from the presence of structures due to entanglement risk would be reduced from moderate, as in Alternative B, to minor for sea turtles as impacts would be detectable and measurable but not expected to lead to population-level effects.

Traffic: As discussed in Section 3.5.7.3.3, vessel strikes are a significant concern for all sea turtles. AMMM measures MMST-9, MMST-14, and MUL-33, include vessel strike avoidance procedures such as the use of trained observers, reduced vessel speeds, minimum separation distances, and project-specific training for all vessel crew, and are considered effective at reducing the risk of vessel strike to sea turtles, though they would not completely eliminate it. Speed restrictions designed specifically to reduce strike risk for NARWs (MMST-14), will also be beneficial for sea turtles by reducing the risk of collision as well as serious injury or mortality occurring. Additionally, AMMM measure MMST-14 would specifically require lessees to follow vessel strike avoidance conditions for any construction, operations, or decommissioning vessel transits associated with the project—including trained lookouts searching specifically for sea turtles—and report any sightings. The proposed mitigation outlined above is expected to reduce the risk of vessel strikes occurring or resulting in severe injury or mortality. Therefore, impacts on sea turtles would remain as minor as effects would be detectable and measurable, though would not be expected to lead to population-level consequences.

Survey gear utilization: AMMM measure ST-3 is the primary measure that would reduce the risk of sea turtle entanglement in fisheries monitoring survey gear as it requires projects to have adequate disentanglement equipment onboard when deploying any fixed gear. STF-2 also provides guidelines for safe handling and resuscitation of sea turtles caught in gear which would reduce the risk of long-term impacts or injuries occurring for entangled individuals. AMMM measure MUL-13 would implement a requirement that at least one survey staff onboard trawl and ventless trap surveys be trained in protected species identification and safe handling, and disentanglement procedures would be available onboard. AMMM measure MUL-9 would require that all reasonable efforts are undertaken to recover any survey gear that is lost during any phase of the NY Bight project, including G&G surveys, biological monitoring surveys, and fisheries monitoring surveys. Fast recovery of the lost gear would benefit sea turtles by reducing the amount of time lost gear is in the water and thereby reducing the likelihood of a sea turtle becoming entangled. Additional AMMM measures related to survey gear utilization (MUL-8, STF-2, STF-4) are more focused on tracking gear types and origins and reporting any incidents of entanglement or injury to the proper agencies. While this information is beneficial for tracking take and realized impacts on sea turtle populations, it does not reduce the risk of entanglement occurring and would not lower the impact level.

With the measures laid out in AMMM measures ST-3 and STF-2, the risk of a serious injury or mortality occurring for any sea turtle species during biological or fisheries monitoring surveys under one NY Bight project would be reduced. However, the potential impacts of entanglement would still be detectable and measurable for sea turtles, so impacts under Sub-alternative C1 would remain minor.

Lighting: AMMM measure MUL-37 would propose the use of an FAA-approved vendor for the ADLS, which will activate the FAA hazard lighting only when an aircraft is in the vicinity of the wind farm to reduce visual impacts at night. While this measure is primarily geared towards birds, cultural, and scenic and visual resources, it will indirectly benefit sea turtles by reducing the overall amount of time the safety lights are active on the project turbines. However, as discussed in Section 3.5.7.4.1, the overall effects of artificial lighting from offshore wind projects would be negligible given available data on sea turtle responses to artificial lighting, and the addition of this AMMM measure would result in a nominal reduction in the lighting produced by one NY Bight project. Therefore, the potential impacts of lighting under Sub-alternative C1 would remain negligible.

Impacts of Six Projects

The same IPF impact types and mechanisms described under one NY Bight project also apply to six NY Bight projects. There would be more potential for impacts for these IPFs due to the greater amount of offshore and onshore development under six NY Bight projects. However, with the AMMM measures described in Section 3.5.7.5.1 and Appendix G, impacts under six NY Bight projects are not expected to differ substantially from one NY Bight project. Therefore, impacts from all IPFs are expected to be the same as that discussed in Section 3.5.7.5.1 for one NY Bight project, though over the broader geographic and temporal scale covered by the six NY Bight projects.

Under a concurrent exposure scenario in which multiple NY Bight lease areas are under construction simultaneously, the overall proportion of the NY Bight ensonified by impact pile-driving noise would increase compared to the proportion ensonified by just one project, which could increase the risk of sea turtles in the NY Bight being exposed to above-threshold noise. However, as discussed for one project above, with the AMMM measures identified under Sub-alternative C1 for all six projects—which include monitoring by trained PSOs of designated clearance and exclusion zones and soft-start procedures—the risk of PTS occurring in sea turtles would be minimized by reducing the likelihood and duration of sea turtles being within range of a given pile driving event to encounter sound levels sufficient to result in PTS. Even with concurrent construction of six NY Bight projects, the area over which PTS effects may occur and the risk of sea turtles experiencing above-threshold sound levels would still be limited to a localized area around each pile installation event that would be sufficiently monitored by trained PSOs. Therefore, no additive risk of effects is expected with construction of six projects such that loss of individuals would occur, and impacts would remain minor for impact pile driving of OSS and WTG foundations under Sub-alternative C1.

Similarly with all other IPFs, either the timing or extent of the potential impacts is small enough such that consideration of six projects would not have any additive effects, and no substantial difference in these impacts on sea turtles is expected between one and six projects.

Impacts of Sub-Alternative C1 (Preferred Alternative) on ESA-Listed Species

General impacts of the Sub-alternative C1 on sea turtles were described in the previous subsection. Because all sea turtle species present in the NY Bight area are listed under the ESA, the impact determinations provided in the previous subsections would apply here.

Cumulative Impacts of Sub-Alternative C1 (Preferred Alternative)

Under Sub-alternative C1, the same ongoing and planned non-offshore-wind and offshore wind activities described for Alternative A in Section 3.5.7.3 would continue to contribute to the potential for impacts on sea turtles. In context of reasonably foreseeable environmental trends and planned actions, the cumulative impacts of Sub-alternative C1 (for six NY Bight projects)—when combined with ongoing and planned actions—would be negligible to moderate. Sub-alternative C1 would contribute to the cumulative impacts primarily through impact pile-driving noise, increased vessel traffic, and the presence of structures as related to fishing gear entanglement. Minor beneficial impacts would result from the presence of structures, though this benefit may be offset given the increased risk of entanglement due to derelict fishing gear on the structures.

3.5.7.5.2 Sub-Alternative C2: Previously Applied and Not Previously AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied (Table 3.5.7-9).

Table 3.5.7-9. Summary of not previously applied avoidance, minimization, mitigation, and monitoring measures for sea turtles

Measure ID	Measure Summary
MUL-22	This measure would reduce noise impacts on marine mammals, sea turtles, and finfish by establishing received sound level limits (RSLL) that will require non exceedance of an acoustic threshold at 1,000 or 1,500 meters, depending on the year of pile installation.
STF-5	This measure proposes requiring disengaging trailing suction hopper dredge pumps when dragheads are not in use to prevent impingement or entrainment of sea turtle species.

Impacts of One Project

AMMM measures MUL-22 and STF-5 could reduce impacts on sea turtles compared to those under Sub-alternative C1 for impact pile-driving and cable emplacement. Impacts for other IPFs would remain the same as described under Sub-alternative C1 (Section 3.5.7.5.1).

Cable emplacement and maintenance: AMMM measure STF-5 proposes disengaging dredge pumps when dragheads are not in use for offshore activities requiring the use of a trailing suction hopper dredge to prevent impingement or entrainment of sea turtle species. This would work to keep the dragheads firmly on the bottom to prevent impingement or entrainment of sea turtle species. Pumps would be disengaged when lowering dragheads to the bottom to start dredging, turning, or lifting dragheads off the bottom at the completion of dredging. However, the use of trailing suction hopper dredges for one NY Bight project is not definite, and—given the lower risk of encounters between dredgers and sea turtles in open ocean areas—the risk of entrainment in dredgers is low.

The implementation of this measure would be expected to contribute to the reduction of turbidity and provide an additional measure to reduce entrainment/impingement of sea turtles when added to the previously applied mitigation measures under Sub-alternative C1. The potential effects on sea turtles are therefore unlikely to differ substantially from Sub-alternative C1 (Section 3.5.7.4.1). Therefore, effects from cable emplacement and maintenance would remain negligible under Sub-alternative C2.

Noise: AMMM measure MUL-22 would establish a RSLL such that sound fields generated during impact pile-driving would not exceed thresholds defined by NOAA Fisheries for marine mammal hearing groups. As detailed in Appendix G, the RSLL requirements are specific to a frequency weighted SEL of 183 dB re 1 μPa^2 s (the PTS-onset threshold for low-frequency cetacean species) and an unweighted Lpk of 202 dB re 1 µPa (the PTS-onset threshold for high-frequency cetacean species). In comparison, the PTS-onset threshold for sea turtles is an unweighted SEL of 204 μPa^2 s and an unweighted Lpk of 232 dB re 1 µPa (Table 3.5.7-4). While MUL-22 uses marine mammal acoustic thresholds as the target limit, the area ensonified above the sea turtle PTS-onset thresholds would be expected to fall within the area ensonified above the marine mammal thresholds (since the sea turtles thresholds are higher), so reducing the range over which the marine mammal RSLL may be exceeded to a maximum of 1,500 meters would benefit sea turtles by reducing the range over which their PTS threshold would be exceeded. Additionally, minimizing the PTS ranges would reduce the range to TTS and behavioral disturbance thresholds. Reduction in the size of the PTS ranges in turn reduces the size of clearance and shutdown zones, which improves the ability for trained PSOs or other monitoring technologies to successfully detect sea turtles in and near those zones and reduces the risk of sea turtles being within these zones to experience above-threshold noise. MUL-22 could also minimize noise impacts if developers discover glauconite sands during construction and installation, which may result in increased noise levels as developers determine if the glauconite is passable. Developers would need to use different methodology, technology, or infrastructure, or apply other quieting techniques to reduce their RSLL if glauconite sands are discovered. Therefore, this AMMM measure, though designed specifically for marine mammals, would benefit sea turtles.

The potential reduction in the noise level as a result of these not previously applied AMMM measures would be beneficial for all sea turtles; however, impacts from impact pile-driving under Sub-alternative C2 are unlikely to differ substantially from those under Sub-alternative C1 (Section 3.5.7.4.1). The AMMM measures under Sub-alternative C2 would not reduce potential impacts on sea turtles from impact pile-driving such that impacts are not measurable or are difficult to measure; therefore, they would continue to be detectable and measurable but of low intensity, localized, and short-term like described under Sub-alternative C1. Effects from impact pile-driving would remain minor under Sub-alternative C2.

Impacts of Six Projects

The same IPF impact types and mechanisms described under a single NY Bight project also apply to six NY Bight projects. However, there would be more potential for impacts for these IPFs due to the greater amount of offshore and onshore development under six NY Bight projects, although these impacts could be reduced with the not previously applied AMMM measures under Sub-alternative C2. However, the not previously applied AMMM measures would not change the impact determinations under six projects compared to Sub-alternative C1 (Section 3.5.7.5.1). The only not previously applied AMMM measures under Sub-alternative C2 apply to impact pile-driving noise, so there is no change from Sub-alternative C1 for all other IPFs.

For impact pile-driving, though construction of six NY Bight projects increases the geographic and temporal scale over which pile-driving activities would occur, the implementation of the additional AMMM measures would reduce the likelihood and extent over which sea turtles may be exposed to above-threshold noise. Particularly with MUL-22, the range over which the sea turtle acoustic thresholds may be exceeded would be localized to an immediate area around each pile-driving event such that risk of exposure from six projects would not be additive and would remain the same as that described for one project. Therefore, impact pile-driving impacts associated with six projects under Sub-alternative C2 would remain detectable and measurable but low intensity, localized, and short-term. Because no population-level effects would occur, impacts would remain minor, as assessed under Alternative B and Sub-alternative C1.

Impacts of Sub-Alternative C2 on ESA-Listed Sea Turtles

General impacts of Sub-alternative C2 on sea turtles were described in the previous subsection. All sea turtle species present in the NY Bight area are listed under the ESA; therefore, the impact determinations provided in the previous subsections would apply here.

Cumulative Impacts of Sub-Alternative C2

Under Sub-alternative C2, the same ongoing and planned non-offshore-wind and offshore wind activities described for Alternative A (Section 3.5.7.3) would continue to contribute to the potential impacts on sea turtles. Impacts on sea turtles are anticipated to be similar to those described under Alternative B. While the not previously applied AMMM measures for six NY Bight projects can reduce potential adverse impacts, the impact level determination is not expected to change under Sub-alternative C2. In context of reasonably foreseeable environmental trends and planned actions, the cumulative impacts of Sub-alternative C2 (for six NY Bight projects)—when combined with ongoing and planned actions—would be negligible to moderate. Sub-alternative C2 would contribute to the cumulative impacts primarily through impact pile-driving noise, increased vessel traffic, and the presence of structures as related to fishing gear entanglement. Minor beneficial impacts would result from the presence of structures, though this benefit may be offset given the increased risk of entanglement due to derelict fishing gear on the structures.

3.5.7.5.3 Conclusions

Impacts of Alternative C. Project construction and installation, O&M, and conceptual decommissioning either from one or six NY Bight projects, would result in habitat disturbance (presence of structures and new cable emplacement), habitat conversion (presence of structures), underwater and airborne noise, vessel traffic (strikes and noise), and potential discharges/spills and trash under Sub-alternatives C1 and C2. For both one and six NY Bight projects and Sub-alternatives C1 and C2, BOEM expects individual impacts ranging from **negligible** to **moderate** for sea turtles because impacts from most IPFs would be noticeable and measurable, but likely would not affect the viability of any sea turtle populations; previously applied AMMM measures would reduce some impacts on sea turtles compared to Alternative B for accidental releases, pile driving, and presence of structures. Moderate impact levels would mainly result from UXO detonations. **Minor beneficial** impacts for sea turtles are expected to result from the presence of structures for both one and six NY Bight projects and under Sub-alternatives C1 and C2. AMMM measures that have not been previously applied would further reduce impacts on sea turtles from new cable emplacement and noise, but these reductions would not be sufficient to lower the impact determination from Sub-alternative C1.

Cumulative Impacts of Alternative C. The cumulative impacts of Sub-alternatives C1 and C2 consider the impacts of implementing AMMM measures identified in Appendix G and in combination with other ongoing and planned non-offshore-wind and offshore wind activities described for Alternative A in Section 3.5.6.3. BOEM anticipates that the cumulative impacts on sea turtles in the geographic analysis area under six NY Bight projects would likely be **negligible** to **moderate**. Moderate impact levels would mainly result from impact pile driving and construction noise, UXO detonation, risk of vessel strikes due to non-offshore-wind vessel traffic described under Alternative A, and the presence of structures as related to fishing gear entanglement. **Minor beneficial** impacts for sea turtles are expected to result from the presence of structures, though these beneficial impacts may be offset given the increased risk of entanglement due to derelict fishing gear on the structures. Impacts may be measurable and detectable but would not be expected to affect the viability of any sea turtle populations. In the context of other reasonably foreseeable environmental trends, the impacts contributed by Sub-alternatives C1 and C2 to the cumulative impact on sea turtles would range from undetectable to appreciable for pile-driving noise, increased vessel traffic, and the presence of structures as related to fishing gear entanglement. Implementation of AMMM measures that would have otherwise not been implemented under Alternative B would reduce impact levels to sea turtles for some IPFs.

3.5.7.6 Recommended Practices for Consideration at the Project-Specific Stage

BOEM is recommending that lessees consider analyzing the RPs in Table 3.5.7-10 to further reduce potential sea turtle impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.5.7-10. Recommended practices for sea turtles impacts and related benefits

Recommended Practice	Potential Benefit
MUL-5: Use equipment, technology, and best practices to produce the least amount of noise possible and reduce noise impacts.	Using noise reduction measures to produce the least amount of noise practicable would likely minimize disturbance/displacement impacts.
MUL-6: Use low noise practices or quieting technology to install foundations, when possible, to limit noise impacts.	The consideration of non-pile-driving foundation types (e.g., suction buckets, gravity-based foundations) first, and the use of the best available quieting technology should be applied to reach the received sound level limit (MUL-22). Using quieting technology (e.g., noise attenuation system [NAS]) reduces the risk of noise impacts on sea turtles by reducing the sound levels that propagate from the pile source. Available studies suggest that when a single or combined NAS is applied to monopile installation, noise reductions ranging from 3 to 17 dB can be achieved, depending on the NAS combination, with some frequency-dependent reductions of over 20 dB (Bellmann et al. 2020).
MUL-7: Use the most current International Maritime Organization's (IMO) Guidelines for the reduction of underwater radiated noise, including propulsion noise, machinery noise, and dynamic positioning systems for project vessels.	Following IMO guidelines would reduce underwater vessel noise.
MUL-10c: Minimize survey vessel interactions with protected species during the use of a moon pool.	Following protocols for moon pool use and monitoring for protected species would minimize vessel interactions with protected species.
MUL-12: Incorporate ecological design elements where practicable.	Using ecological designs elements such as those that could encourage growth of flora or fauna could enhance potential benefits to sea turtles due to the reef effect.
MUL-14b: When MEC avoidance is not possible, submitted UXO/MEC avoidance plans should follow, when finalized, the US Committee on the Marine Transportation System general guidance on MEC.	Following the US Committee on the Marine Transportation System general guidance on MEC would minimize effects from MEC detonation on sea turtles.
MUL-18: Coordinate transmission infrastructure among projects such as by using shared intra- and interregional connections, meshed infrastructure, or parallel routing.	Using a shared infrastructure would consolidate the extent of transmission cables, which could reduce the geographic extent of impacts, from cable emplacement and maintenance and EMF and cable heat. This RP may minimize potential impacts from offshore export cables on sea turtles.
MUL-21: Use the best available technology, including new and emerging technology, when possible and consider upgrading or retrofitting equipment. It may include technology such as jet plows, closed-loop	The use of jet plows would minimize the extent of turbidity plumes associated with cable emplacement as compared to other installation methods. As described in Section 3.4.2, *Water Quality*, a closed-loop subsea cooler system is an emerging technology,

Recommended Practice	Potential Benefit
cooling systems and new foundations designs that do not rely on pile driving.	that, if applied, would eliminate entrainment risks to sea turtles and may minimize localized hydrodynamic and thermal plume impacts because intake and discharge of seawater would not occur. Using foundation designs that do not rely on pile-driving would, if employed, reduce noise exposure to sea turtles.
MUL-23: Avoid or reduce potential impacts on important environmental resources by adjusting project design.	Adjusting project design could include analysis of the turbine layout in order to reduce potential impacts from the presence of structures. MUL-23 could include use of BOEM's risk assessment tool to model potential encounter rates between sea turtles and vessel traffic from offshore wind energy development (i.e., the "vessel strike model"). Use of this tool will serve to identify potential encounter rates between ESA-listed sea turtle species and project vessels; speed and routing variables can be incorporated to assess when and where high strike risk may occur and identify where additional mitigation measures should be focused and reduce the risk of vessel strikes.
MUL-26: Coordinate regional monitoring and survey efforts across lease areas in the NY Bight to standardize approaches, understand potential impacts to resources at a regional scale, and maximize efficiencies in monitoring and survey efforts. Develop monitoring and survey plans that meet regional data requirements and standards.	Coordinating regional monitoring and survey efforts would maximize the monitoring efficiency. The data gathered would be evaluated and considered for future mitigation and monitoring needs, which will serve to reduce impacts.
MUL-27: Employ methods to minimize sediment disturbance such as use of midline buoys to prevent cable sweep and not side-casting materials.	Minimizing sediment disturbance could reduce impacts during cable emplacement and maintenance.
MUL-39: Use of standard underwater cables designs that mitigate the intensity of EMF at the seafloor.	Shielding of cables could reduce the intensity of EMFs, cable heat, and exposure to sea turtles.
STF-1: Monitor tagged sea turtles using technology strategically placed on WTGs to monitor the effect of the presence of structures on sea turtle habitat use and residency around NY Bight project foundations.	Incorporating technologies for detecting tagged sea turtles and monitoring the effect of increases in habitat use and residency around WTG foundations would provide additional information about impacts on sea turtles and could lead to additional mitigation.

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3.5 Biological Resources

3.5.8 Wetlands

This section discusses potential impacts on wetlands from the Proposed Action, alternatives, and ongoing and planned activities in the wetlands geographic analysis area. The wetlands geographic analysis area, as shown on Figure 3.5.8-1, includes all 10-digit hydrologic unit code watersheds that could be intersected by the NY Bight projects' onshore infrastructure components. This includes locations along the New Jersey and New York coastline where BOEM anticipates wetland impacts associated with the potential construction of the NY Bight projects' onshore components. A broad geographic analysis area was defined due to the uncertainty of the landfall locations and locations of onshore project components.

The wetlands impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Because the locations of onshore components for the NY Bight projects are not known at this time, the analysis of onshore wetland impacts is dependent on a hypothetical project analysis, and impact conclusions consider a maximum-case scenario for onshore development. Additional detailed site-specific analysis will be required for individual COPs. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

3.5.8.1 Description of the Affected Environment and Future Baseline Conditions

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3(c)(16)). Wetlands are important features in the landscape that provide numerous beneficial services or functions. Some of these include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters, providing aesthetic value, ensuring biological productivity, filtering pollutant loads, and maintaining surface water flow during dry periods. The majority of the wetlands in the geographic analysis area are tidally influenced salt marshes, which provide shelter, food, and nursery grounds for coastal fisheries species, including shrimp, crab, and many finfish. Wetlands also protect shorelines from erosion by creating a buffer against wave action and by trapping soils. In flood-prone areas, wetlands reduce the flow of flood water and absorb rainwater. Tidal wetlands also serve as carbon sinks, holding carbon that would otherwise be released into the atmosphere and contribute to climate change. New Jersey and New York's coastal wetlands, including those in the geographic analysis area, protect coastal water quality by acting as a sink for land-derived nutrients and contaminants, constitute an important component of coastal food webs, provide valuable wildlife habitat, and protect upland and shoreline areas from flooding and erosion.

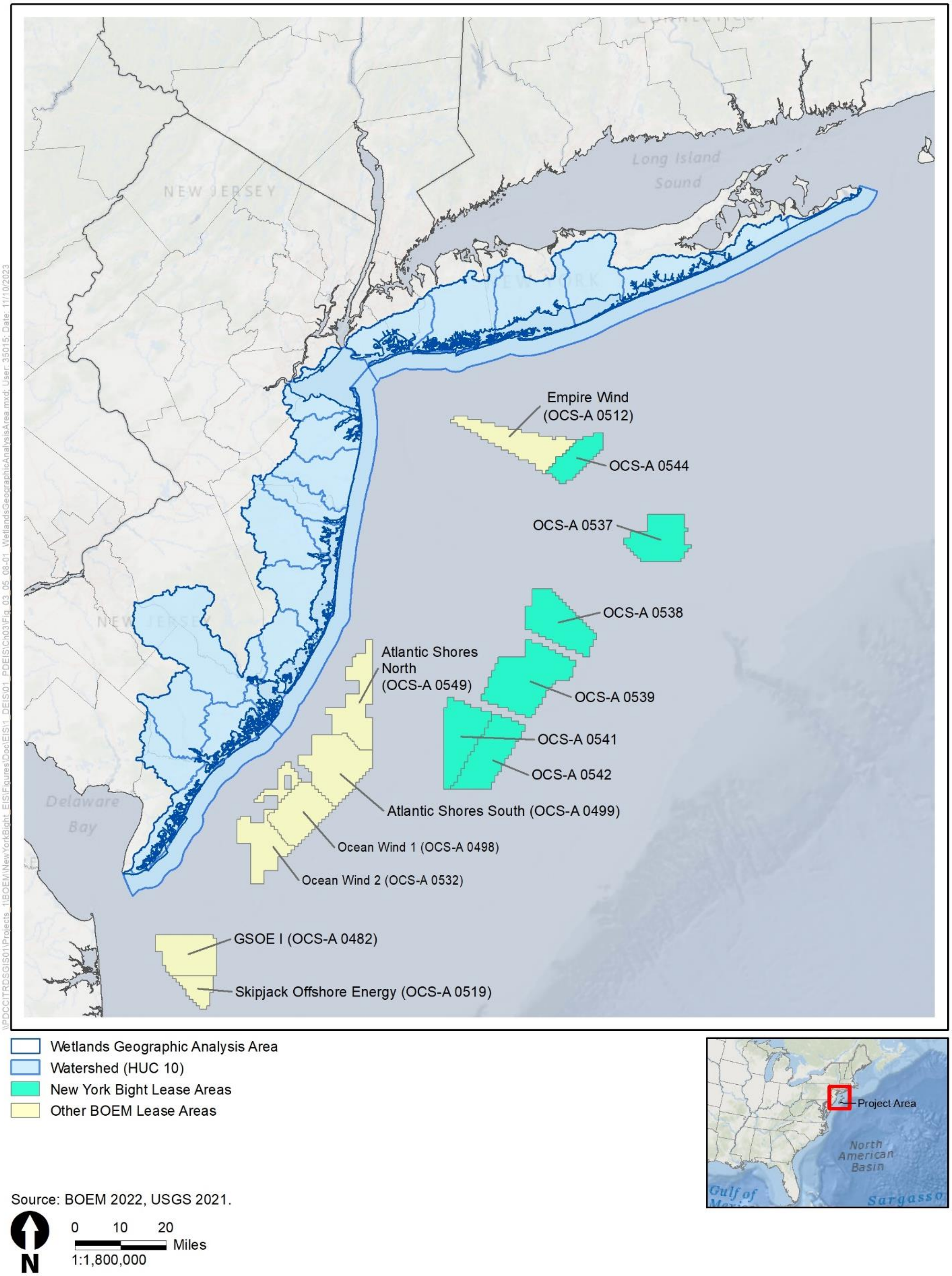


Figure 3.5.8-1. Wetlands geographic analysis area

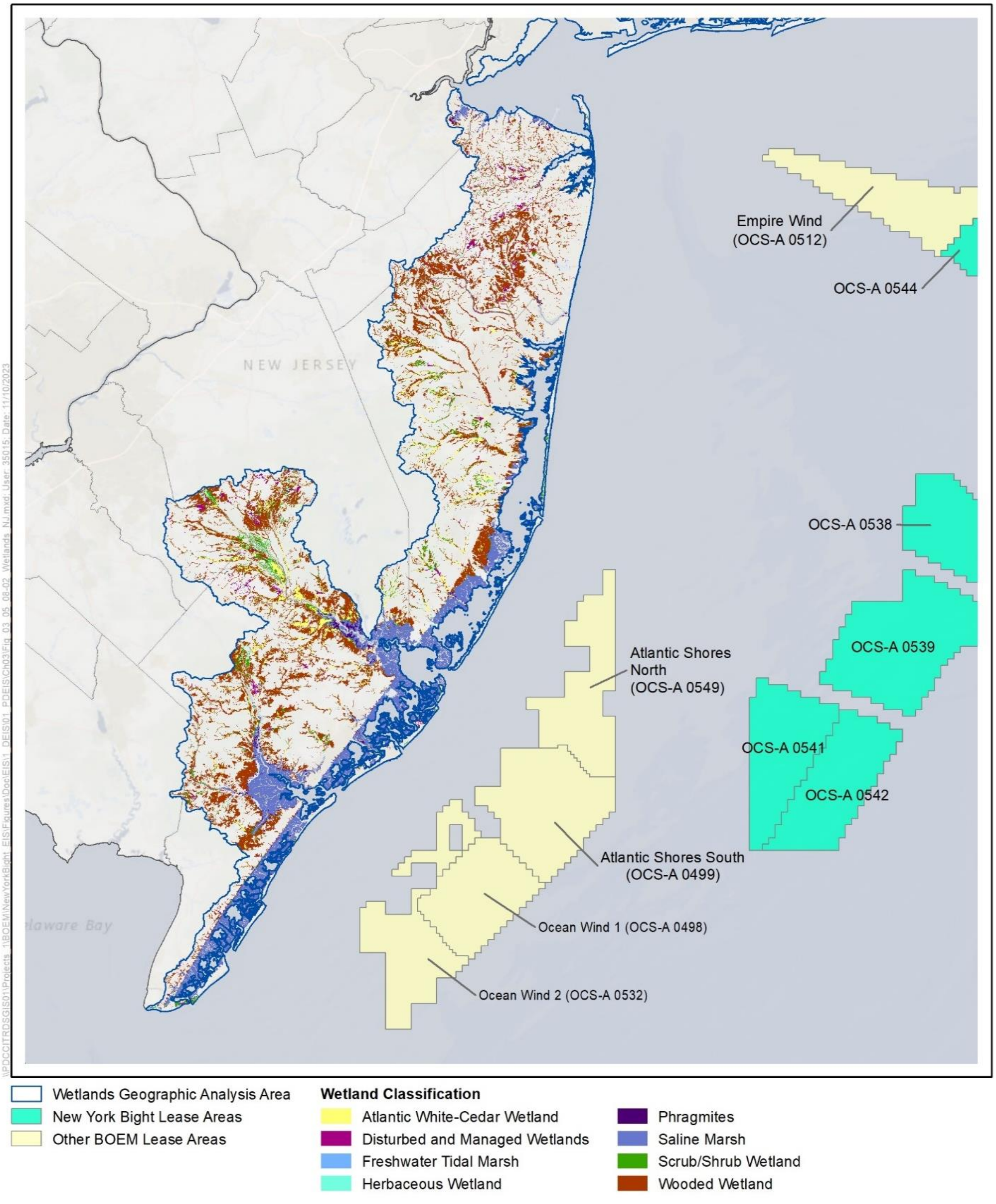
The NWI, State of NJDEP, and NYSDEC wetland GIS data sets were used to determine the potential presence of wetlands in the geographic analysis area. NWI information is provided in Appendix B, *Supplemental Information and Additional Figures and Tables*, and the NJDEP and NYSDEC information is provided in this section. These datasets map both tidal and non-tidal wetlands. Tidal wetlands in the geographic analysis area are areas where the Atlantic Ocean and estuaries meet land, are found below the spring high tide line, and are subject to regular flooding by the tides. Tidal wetlands are typically categorized into two zones: high marsh and low marsh. Non-tidal wetlands, otherwise referred to as freshwater wetlands, are not influenced directly by tides and are typically categorized based on their hydrology and predominant vegetation. To confirm the extent and presence of regulated wetlands within the onshore project area of the NY Bight projects, a wetland delineation must be conducted to identify the wetlands under jurisdiction of USACE, NJDEP, and NYSDEC. This is expected to occur for each NY Bight project prior to BOEM's decision approving, approving with modifications, or disapproving the COPs.

The New Jersey geographic analysis area contains 332,424 acres of wetlands (Table 3.5.8-1 and Figure 3.5.8-2) (NJDEP 2021). Threats to the state's wetlands include land reclamation, development, dredging, nutrient overload, and sea level rise due to climate change. Sea level rise is considered the largest climate-related threat to salt marshes along the New Jersey shore. New Jersey's climate has warmed by about 3 degrees (F) in the last century, heavy rainstorms are more frequent, and the sea is rising about 1 inch every 6 years. Higher water levels are eroding beaches, submerging lowlands, exacerbating coastal flooding, and increasing the salinity of estuaries and aquifers. Sea level is rising more rapidly along the New Jersey shore than in most coastal areas because the land is sinking (USEPA 2016a).

Table 3.5.8-1. Wetlands in the New Jersey geographic analysis area

Wetland Community	Acres	Percent of Total
Atlantic White-Cedar Wetland	23,842	7.2
Disturbed and Managed Wetlands	12,153	3.7
Freshwater Tidal Marsh	65	0.0
Herbaceous Wetland	3,907	1.2
Phragmites	7,053	2.1
Saline Marsh	100,727	30.3
Scrub/Shrub Wetland	20,078	6.0
Wooded Wetland	164,600	49.5
Total	**332,424**	**100.0**

Source: NJDEP 2021.



Source: BOEM 2022, NJDEP 2021.

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Figure 3.5.8-2. Wetlands in the New Jersey geographic analysis area

In New York, the NYSDEC identifies and maps two general types of wetlands: tidal wetlands and freshwater wetlands. In the geographic analysis area, tidal wetlands occur around the Long Island coastline, and freshwater wetlands occur inland on Long Island typically on river and lake floodplains (i.e., outside the influence of tidal waters). Both tidal and freshwater wetlands habitats are protected under the state's Tidal Wetland Act (1973) and the Freshwater Wetlands Act (1975). Freshwater wetlands are identified on the basis of vegetation and must be at least 12.4 acres (5 hectares) to be protected under the Freshwater Wetlands Act. Freshwater wetlands smaller than 12.4 acres (5 hectares) would be protected under the CWA (Section 404) if they are determined to be jurisdictional under the CWA by the USACE. Freshwater wetlands are also classified as Class I, II, III, or IV wetlands, which correspond to the benefits the wetland may provide (Class I provides the greatest benefits, Class IV the least benefits). NYSDEC has mapped all tidal and freshwater wetlands in New York, and these wetlands in the geographic analysis area are shown in Figure 3.5.8-3.

New York's climate is changing: most of the state has warmed 1 to 3 degrees (F) in the last century, heavy rainstorms are more frequent, and the sea is rising about 1 inch every decade. Higher sea levels are eroding beaches, submerging lowlands, exacerbating coastal flooding, and threatening coastal wetlands and estuaries. Sea level is rising more rapidly along New York's coast than in most coastal areas because the land surface is sinking (USEPA 2016b).

The New York geographic analysis area contains 36,225 acres (14,659 hectares) of wetlands, according to Cornell University Geospatial Information Repository (2013) and the NYSDEC wetland data (NYSDEC 2005). Table 3.5.8-2 displays the wetlands within the geographic analysis area based on NYSDEC wetland data.

Table 3.5.8-2. Wetlands in the New York geographic analysis area

Wetland Community	Acres	Percent of Total
Freshwater Wetlands		
Freshwater Wetland Class I	8,817	24
Freshwater Wetland Class II	1,327	4
Freshwater Wetland Class III	181	<1
Tidal Wetlands		
Coastal Shoals, Bars and Mudflats	2,136	6
Formerly Connected	542	1
Fresh Marsh	471	1
High Marsh	5,637	16
Intertidal Marsh	11,374	31
Littoral Zone	5,740	16
Total	**36,225**	**100.0**

Source: CUGIR 2013; NYSDEC 2005.

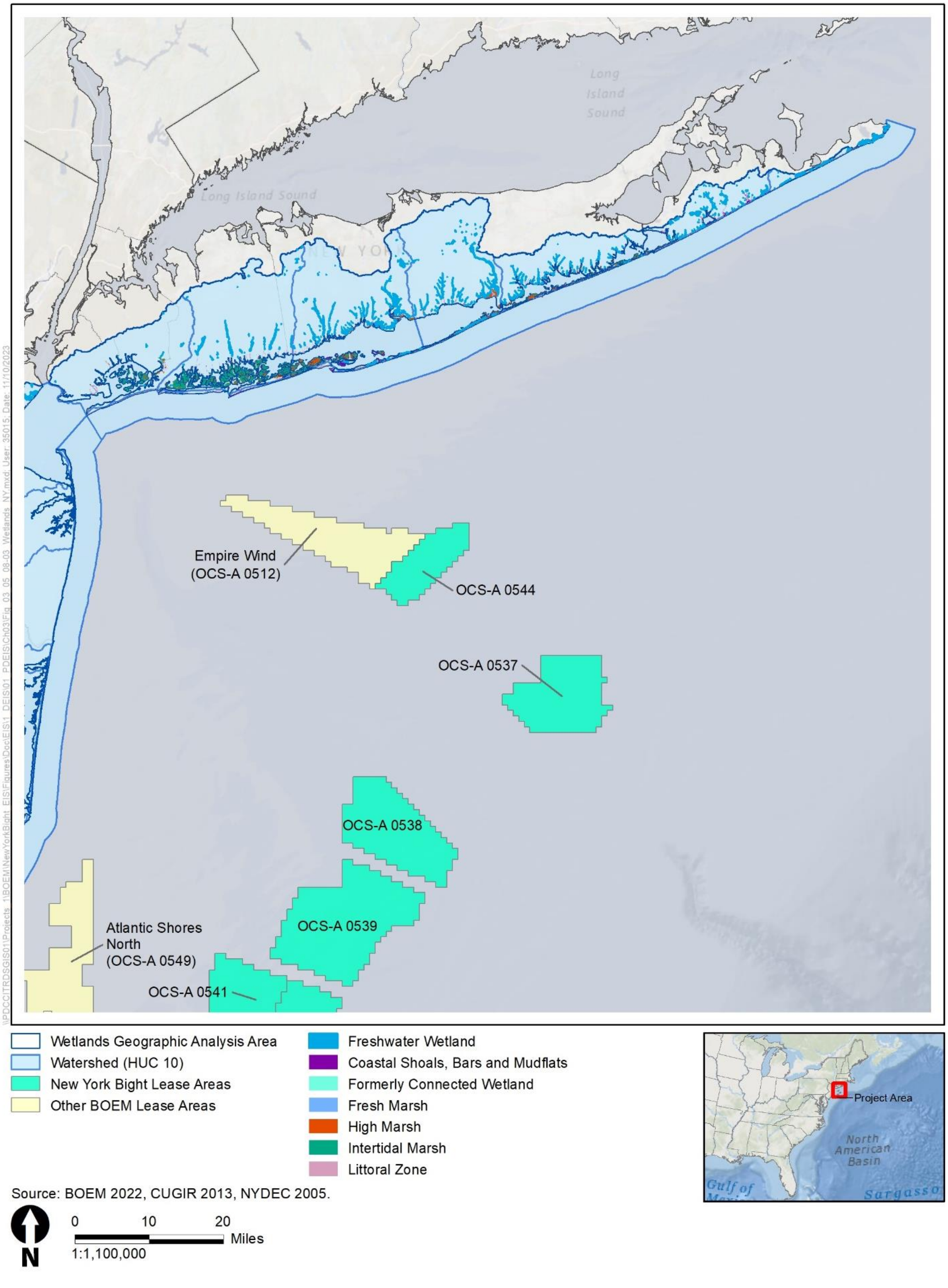


Figure 3.5.8-3. Tidal and freshwater wetlands in the New York geographic analysis area

3.5.8.2 Impact Level Definitions for Wetlands

BOEM's general impact definitions of potential adverse impact levels for wetlands are provided in Table 3.5.8-3. USACE, NJDEP, and NYSDEC define wetland impacts differently than BOEM due to requirements under CWA Section 404, the New Jersey Freshwater Wetlands Protection Act (1987), and the New York State Tidal Wetlands Act (1973) and Freshwater Wetlands Act (1975).

Table 3.5.8-3. Adverse impact level definitions for wetlands

Impact Level	Definition
Negligible	Impacts on wetlands would be so small as to be unmeasurable, and impacts would not result in a detectable change in wetland quality and function.
Minor	Impacts on wetlands would be minimized; and would be relatively small and localized. If impacts occur, wetland functions and values would completely recover.
Moderate	Impacts on wetlands would be minimized; however, permanent impacts would be unavoidable. Compensatory mitigation would be required to offset impacts on wetland functions and values, and mitigation measures would have a high probability of success.
Major	Impacts on wetlands would be minimized; however, permanent impacts would be regionally detectable. Extensive compensatory mitigation would be required to offset impacts on wetland functions and values, and mitigation measures would have a marginal or unknown probability of success.

The New Jersey Freshwater Wetlands Protection Act defines temporary disturbance as a regulated activity that occupies, persists, or occurs on a site for no more than 6 months. Impacts on wetlands that persist longer than 6 months are considered permanent.

USACE defines temporary impacts as those that occur when fill or cut impacts occur in wetlands that are restored to preconstruction contours when construction activities are complete (e.g., stockpile, temporary access). Conversion of a wetland type is also considered a permanent impact.

BOEM expects offshore wind projects in the NY Bight lease areas would be designed to avoid wetlands to the extent feasible, and would be required to comply with federal, state, and local regulations related to the protection of wetlands by avoiding or minimizing impacts. This would include compliance with the New York or New Jersey State Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Construction Activities and implementation of sediment controls and a SWPPP to avoid and minimize water quality impacts during onshore construction. Projects would also need to comply with both tidal and non-tidal wetlands enforceable policies of New Jersey and New York Coastal Management Programs. Any work in wetlands in New Jersey would require a CWA Section 404 permit from USACE or NJDEP (or both) and a Section 401 Water Quality Certification from NJDEP; any wetlands permanently lost would require compensatory mitigation. Any work in wetlands in New York State would require a CWA Section 404 permit from USACE and a Section 401 Water Quality Certification from NYSDEC, as well as authorization from NYSDEC under the Tidal Wetlands Act. If impacts could not be avoided or minimized, mitigation would be anticipated to compensate for lost wetland functions.

Accidental releases and land disturbance are contributing IPFs to impacts on wetlands. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.5.8-4.

Table 3.5.8-4. Issues and indicators to assess impacts on wetlands

Issue	Impact Indicator
Wetland fill and disturbance	Areal extent of tidal and non-tidal wetlands impacted and further characterized using the National Wetlands Inventory mapper
Hydrology	Reduced or increased hydrology changes in hydrological regime
Soil erosion and sedimentation	Qualitative assessment of potential impacts resulting from increased sedimentation into wetlands
Discharges/releases	Qualitative assessment of potential impacts from changes in water quality from stormwater runoff or discharges, HDD activity, and spills

3.5.8.3 Impacts of Alternative A – No Action – Wetlands

When analyzing the impacts of the No Action Alternative on wetlands, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for wetlands. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore-wind and offshore wind activities, as described in Appendix D, *Planned Activities Scenario*.

3.5.8.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for wetlands described in Section 3.5.8.1, *Description of the Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore-wind and offshore wind activities. Ongoing non-offshore-wind activities within the geographic analysis area that may contribute to impacts on wetlands are associated with onshore development activities and climate change.

Ongoing onshore development activities within the geographic analysis area may contribute to impacts by permanently (e.g., fill placement) or temporarily (e.g., stockpile, temporary access) affecting wetlands or areas near wetlands. All projects would be required to comply with existing federal, state, and local regulations related to the protection of wetlands by avoiding or minimizing impacts. If unavoidable permanent wetland impacts (i.e., permanent fill placement) cannot be entirely avoided, then compensatory mitigation would be required to replace lost wetland functions. Climate change–induced sea level rise in the geographic analysis area is also anticipated to continue to affect wetlands. Inundation and rising water levels would result in the conversion of vegetated areas into areas of open water, with a consequent loss of wetland functions associated with the loss of vegetated wetlands. Wetlands have very specific water elevation tolerances and, if water is not deep enough, it is no longer a wetland. Slowly rising waters on a gentle, continuously rising surface can result in wetlands migrating landward. In areas where slopes are not gradual or where there are other features blocking flow (e.g., bulkhead or surrounding developed landscape), wetland migration would be slowed or impeded. Rising coastal waters would also continue to cause saltwater intrusion, which occurs when saltwater starts to move farther inland and creeps into freshwater/non-tidal areas. Saltwater intrusion would continue to change wetland plant communities and habitat (i.e., freshwater species to saltwater species) and overall wetland functions.

As sea level rises along the New Jersey shore, many wetlands will be submerged. Most salt marshes between Cape May and the Meadowlands are unlikely to keep pace if sea level rises 3 feet. Tidal flats are also likely to become open water (USEPA 2016a).

If the oceans and atmosphere continue to warm, tidal waters in New York are likely to rise 1 to 4 feet in the next century. As sea level rises, the lowest dry lands will be submerged and become either tidal wetland or open water. Wetlands can create their own land and keep pace with a slowly rising sea, but if sea level rises 3 feet or more during the next century, most existing wetlands along the south shore of Long Island are likely to be submerged (USEPA 2016b).

There are five ongoing offshore wind projects within the geographic analysis area that could contribute to impacts on wetlands from onshore components (Table 3.5.8-5): South Fork Wind Farm (OCS-A 0517), Ocean Wind 1 (OCS-A 0498), Sunrise Wind (OCS-A 0487), and Empire Wind 1 and 2 (OCS-A 0512). The South Fork Wind Farm includes offshore export cables landing on Long Island, and Ocean Wind 1 includes two offshore export cable routes making landfall in Ocean County, New Jersey and Cape May County, New Jersey. The export cables for Sunrise Wind and Empire Wind would both make landfall on Long Island, New York. These projects' export cable landfall sites are within the geographic analysis area and ongoing construction of the projects could affect wetlands through the primary IPFs of accidental releases and land disturbance; these are described in detail in the following section.

3.5.8.3.2 Cumulative Impacts of the No Action Alternative

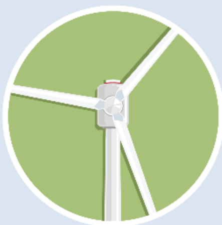
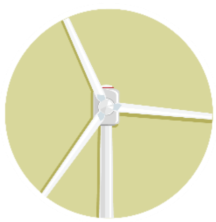
The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects). Other planned non-offshore-wind activities that may affect wetlands would primarily include increasing onshore construction (see Appendix D for a description of planned activities in the onshore environment). These activities may permanently (e.g., fill placement) and temporarily (e.g., vegetation removal) affect wetland habitat, water quality, and hydrologic functions. All activities would be required to comply with federal, state, and local regulations related to the protection of wetlands by avoiding or minimizing impacts. If impacts would not be entirely avoided, mitigation would be anticipated to compensate for wetland loss.

Planned construction of an offshore wind PBI by the NJBPU could result in impacts on approximately 4 acres of wetlands. Areas with potential impacts include disturbance along the PBI route, HDD entry and exit locations, laydown areas, access roads, and other appurtenant facilities. Because the PBI route would occur mostly within roadways and existing rights-of-way, the footprint of potentially disturbed habitats is relatively small. Through a review of NJDEP's vernal habitat mapping, several areas that are mapped as potential vernal habitat are within the PBI route area (NJDEP 2023). These areas would need to be field-verified to confirm presence and potential impacts. All routes from Sea Girt National Guard Training Center (NGTC) to the Larabee Collector Station must cross the Manasquan River. The furthest upstream potential crossing of the Manasquan River would be along the north side of Hospital Road, and the furthest downstream potential crossing would be along the south side of Lakewood-Allenwood Road. Other stream crossings may include a subset of the following Category 1 waterways: Tarkiln

Brook, Woodcock Brook, Haystack Brook, Dicks Brook, Muddy Ford Brook, Sandyhill Brook, and Judas Creek.

Impacts on wetlands from planned offshore wind projects may occur if onshore activity from these planned offshore wind projects overlaps with the geographic analysis area. Ongoing and planned offshore wind activities that could potentially overlap the wetlands geographic analysis area are listed in Table 3.5.8-5.

Table 3.5.8-5. Ongoing and planned offshore wind in the geographic analysis area for wetlands

Ongoing/Planned	Projects by Region
Ongoing – 5 projects[1] 	**MA/RI** • South Fork Wind (OCS-A 0517) • Sunrise Wind (OCS-A 0487) **NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 3 projects[2] 	**NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499)

MA = Massachusetts; NJ = New Jersey; NY = New York; RI = Rhode Island

[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.

[2] Status as of September 20, 2024.

Accidental releases: During onshore construction of offshore wind projects in the geographic analysis area, oil leaks and accidental spills from construction equipment are potential sources of wetland water contamination. While many wetlands act to filter out contaminants, any significant increase in contaminant loading could exceed the capacity of a wetland to perform its normal water quality functions. Degradation of water quality in wetlands could occur during construction, conceptual decommissioning, and to a lesser extent O&M. However, due to the small volumes of spilled material anticipated, these impacts would all be short term until the source of the contamination is removed. Compliance with applicable state and federal regulations related to oil spills and waste handling would minimize potential impacts from accidental releases. These include the Resource Conservation and Recovery Act, Department of Transportation Hazardous Material regulations, and implementation of a Spill Prevention, Control, and Countermeasure Plan. Impacts from accidental releases on wetlands would likely be minor because accidental releases would likely be small and localized, and compliance with state and federal regulations would avoid or minimize potential impacts on wetland quality or functions. As described in Section 2.3, *Non-Routine Activities and Events*, accidental releases of chemicals, gases, or man-made debris may occur as a result of a structural failure and could result in impacts on wetlands.

Land disturbance: Construction of onshore components in the geographic analysis area is anticipated to require clearing, excavating, trenching, fill, and grading, which could result in the loss or alteration of wetlands. This may cause adverse effects on wetland habitat, water quality, and flood and storage capacity functions. Table 3.5.8-6 describes impacts on wetlands from other offshore wind projects in the geographic analysis area.

Table 3.5.8-6. Other offshore wind projects' impacts on wetlands in the geographic analysis area

Offshore Wind Project	Wetland Impacts
Ongoing Offshore Wind Project	
South Fork Wind (OCS-A 0517)	One onshore project component for the South Fork Wind Farm (OCS-A 0517) (Hither Hills onshore cable route) could affect up to 2.02 acres (0.89 hectare) of wetland on Long Island (BOEM 2021).
Ocean Wind 1 (OCS-A 0498)	Ocean Wind 1 (OCS-A 0498) has estimated that up to 1 acre (0.4 hectare) of permanent disturbance would occur within wooded wetlands and approximately 0.53 and 11.92 acres (0.21 and 4.82 hectares) of temporary wetland impacts could potentially occur as a result of interconnection cable burial at BL England and Oyster Creek, respectively (BOEM 2022a).
Sunrise Wind (OCS-A 0487)	The landfall and onshore transmission cable route for Sunrise Wind (OCS-A 0487) is anticipated to result in 0.02 acre (0.08 hectare) of wetland impact on Long Island, New York.
Empire Wind (OCS-A 0512)	Based on NWI-mapped wetlands, 13.64 acres (5.51 hectares) of wetlands within the cable corridor could be susceptible to potential impacts as a result of cable installation associated with the Empire Wind lease area (OCS-A 0512). However, this will not necessarily be the area of wetland that would be affected during construction and operations. Empire Wind is evaluating several methods (trenchless, cable bridge) to avoid and minimize wetland impacts at the Reynolds and Barnums Channel crossings. These two channel crossings account for approximately 12.4 acres (5.01 hectares) or 91 percent of the mapped wetland in the cable corridor.
Planned Offshore Wind Projects	
Ocean Wind 2 (OCS-A 0532)	Ørsted is currently planning the Ocean Wind 2 (OCS-A 0532) project, which will develop the remaining portion of its Ocean Wind federal lease area, located adjacent to Ocean Wind 1 (OCS-A 0498). Potential wetland impact information is unavailable at this time.
Atlantic Shores South (OCS-A 0499)	Atlantic Shores South (OCS-A 0499) has estimated that approximately 0.65 acre (0.26 hectare) of temporary and 0.1 acre (0.04 hectare) of permanent disturbance in wetlands may occur as a result of interconnection cable installation (Atlantic Shores Offshore Wind 2022). Approximately 87 percent of the proposed wetland impacts are temporary and would occur in both emergent and forested wetlands.
Atlantic Shores North (OCS-A 0549)	Atlantic Shores North (OCS-A 0549) has estimated approximately 0.8 acre of permanent disturbance and 1.2 acres of temporary disturbance in wetlands (Atlantic Shores Offshore Wind 2024).

Fill material permanently placed in wetlands during construction would result in the permanent loss of wetlands, including any associated habitat, flood and storage capacity, and water quality functions that the wetlands may provide. If a wetland were partially filled and fragmented or if wetland vegetation were trimmed, cleared, or converted to a different vegetation type (e.g., forest to herbaceous), habitat would then be altered and degraded (affecting wildlife use). Additionally, water quality and flood/storage capacity functions would be reduced by changing natural hydrologic flows and reducing the wetland's ability to impede and retain stormwater and floodwater. On a watershed level, any permanent wetland loss or alteration could reduce the capacity of regional wetlands to provide wetland functions.

Temporary wetland impacts, such as rutting, compaction, and mixing of topsoil and subsoil, may occur from a construction activity that crosses or is adjacent to wetlands. Where construction leads to unvegetated or otherwise unstable soils, precipitation events could erode soils, resulting in sedimentation that could affect water quality in nearby wetlands. The extent of wetland impacts would depend on specific construction activities and their proximity to wetlands. These impacts would occur primarily during construction and conceptual decommissioning; impacts during O&M would only occur if new ground disturbance was required, such as to repair a buried component.

Given that the geographic analysis areas for the planned offshore wind projects are within urbanized landscapes in New Jersey and New York and onshore project components would likely be sited in previously disturbed areas (e.g., along existing roadways and ROW), BOEM anticipates wetland impacts would be minimal. In addition, BOEM expects the offshore wind projects would be designed to avoid wetlands to the extent feasible. However, depending on project-specific details and locations of onshore components, wetland impacts could range from negligible to moderate. All offshore wind projects would be required to comply with federal, state, and local regulations related to the protection of wetlands by avoiding or minimizing impacts. Mitigation would be anticipated for projects to compensate for unavoidable wetland impacts.

3.5.8.3.3 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, wetlands would continue to follow current regional trends and respond to IPFs introduced by ongoing activities. Land disturbance from onshore construction would cause temporary and permanent loss of wetlands. All activities would be required to comply with federal, state, and local regulations related to the protection of wetlands by avoiding or minimizing impacts. If impacts would not be entirely avoided or minimized, mitigation would be anticipated for projects to compensate for lost wetlands. BOEM anticipates that the No Action Alternative would likely result in **negligible** to **moderate** impacts on wetlands. Impacts would likely be **negligible** to **moderate** because permanent wetland impacts would likely occur, and compensatory mitigation would be required.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and wetlands would continue to be affected by natural and human-caused IPFs. Planned activities would contribute to temporary and permanent impacts on wetlands due to accidental releases and land disturbance. BOEM anticipates that the cumulative impacts associated with the No Action Alternative, when combined with all other planned activities (including offshore wind) in the geographic analysis area would likely be **negligible** to

moderate given that permanent wetland impacts could occur, and any activity would be required to comply with federal, state, and local regulations related to the protection of wetlands and mitigation of impacts.

3.5.8.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Wetlands

3.5.8.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Accidental releases: Onshore construction activities would require heavy equipment use and HDD activities, and potential spills could occur as a result of an inadvertent release from the machinery or during refueling activities. Applicants would develop and implement a Spill Prevention, Control, and Countermeasure Plan to minimize impacts on water quality (prepared in accordance with applicable NJDEP and NYSDEC regulations). In addition, all waste generated onshore would comply with applicable federal regulations, including the Resource Conservation and Recovery Act and the Department of Transportation Hazardous Material regulations. Therefore, BOEM anticipates a single NY Bight project would result in minor and short-term impacts on wetlands as a result of releases from heavy equipment during construction and other cable installation activities.

Land disturbance: Construction impacts on wetlands and related functions would be similar to those described for the No Action Alternative. The primary wetland impacts would be filling, excavation, rutting, compaction, mixing of topsoil and subsoil, and potential alteration due to clearing. These impacts would be temporary in those locations where onshore project components do not require permanent fill, as restoration would be conducted in accordance with applicable CWA permit requirements. Following installation of interconnection cables within wetlands, topography would be restored, and soils would be de-compacted to avoid long-term impacts on soils and hydrology. Long-term changes from wooded to herbaceous wetlands could occur if clearing is required in wooded wetlands. Placement of fill within a wetland would result in loss of wetlands, and permanent conversion of wooded wetlands to herbaceous or shrub/scrub wetlands would constitute a permanent impact on wetlands because of the conversion to a different vegetation type. Other long-term impacts on wetlands could include clearing wooded wetlands within a temporary workspace. While these would be allowed to revert to forested wetland conditions, after construction, the recovery could take decades or longer and is therefore not considered a temporary impact. Following construction, temporary disturbed areas (e.g., temporary wetland fill, non-forest vegetation clearing) would be restored to pre-existing conditions and revegetated.

Where applicable, onshore interconnection cables would be installed using trenchless technology (e.g., jack-and-bore, pipe jacking, or HDD) beneath wetlands to minimize direct impacts on these resources. Entry/exit work areas would be in disturbed upland areas to further avoid impacts on wetlands. Water quality within wetlands could be affected by sedimentation from nearby exposed soils. To prevent indirect impacts, such as soil erosion and sedimentation from land-disturbing construction activities, on wetlands and waterbodies applicants would need to comply with an approved Soil Erosion and Sediment Control Plan, obtain coverage under a National Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Construction Activities, and prepare a SWPPP for the project. In accordance with these plans, BMPs—including, but not limited to, dust abatement and installation of silt fencing, filter socks, and inlet filters—would be implemented to minimize or avoid potential effects. Additionally, once construction is completed, areas of temporary disturbance would be returned to preconstruction conditions, and at the onshore substations land would be appropriately graded, graveled, or revegetated to prevent future erosion.

Based on recent offshore wind projects under BOEM review, BOEM anticipates that impacts on wetlands from a single NY Bight project would be mostly avoided or minimized by adhering to the requirements of federal, state, and local wetland permitting. However, the area of wetland impacted could vary widely, depending on the specific siting of the onshore project components. Therefore, wetland impacts could range from none to potential permanent filling or clearing of wetlands. Mitigation, if required under federal and state wetland regulations, would likely include a combination of restoration, enhancement, creation, or in-lieu fee (credit purchase). In summary, potential adverse impacts on wetlands from one NY Bight project, should any occur, would be temporary and permanent, and long term and shorter term; this impact would range from negligible to moderate depending on the siting of project components.

3.5.8.4.2 Impacts of Six Projects

The same accidental releases and land disturbance IPF impact types and mechanisms described for one NY Bight project would apply to six NY Bight projects. There would be more potential for impacts from these IPFs due to the greater amount of onshore development under six NY Bight projects. However, accidental release impacts are still expected to be minimal as all six NY Bight projects would develop and implement a Spill Prevention, Control, and Countermeasure Plan to minimize impacts on water quality. Similar to one NY Bight project, the level of impact on wetlands from land disturbance depends on the amount, function, impact type, and duration. While BOEM anticipates that impacts on wetland habitat from onshore construction activities of six NY Bight projects would be minimized to the extent practicable, it is reasonable to assume that larger areas of wetland could be temporarily and permanently affected, resulting in negligible to moderate impacts. The impact of six NY Bight projects would not change the impact conclusion compared to one NY Bight project due to each project requiring federal and state wetland permits.

3.5.8.4.3 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of onshore infrastructure for offshore wind activities across the geographic analysis area would also contribute to the primary IPFs of accidental releases and land disturbance. Temporary disturbance and permanent loss of wetland may occur as a result of constructing infrastructure such as substations and onshore export cables for offshore wind development. Any wetland impact is anticipated to be minimal due to federal, local, and state wetland requirements to avoid and minimize wetland impacts. However, the area of wetland impact could vary widely depending on the specific siting of the onshore project components.

Six NY Bight projects would contribute to the combined accidental release impacts on wetlands from ongoing and planned activities including offshore wind. Impacts would likely be short term and minor due to the low risk and localized nature of the most likely spills, the use of an Oil Spill Response Plan for projects, and regulatory requirements for the protection of wetlands. The development of six NY Bight projects could contribute to the impacts on the land disturbance impacts from ongoing and planned activities including offshore wind. Impacts would likely be temporary to permanent and moderate because permanent wetland impacts would likely occur, and compensatory mitigation would be required. BOEM would not expect normal O&M activities to involve further wetland alteration. Onshore cable routes and associated substation/converter station facilities and POIs generally have no maintenance needs unless a fault or failure occurs; therefore, O&M is not expected to have any notable effects on wetlands.

Although impacts on wetlands would be avoided and minimized, compensatory mitigation would likely be necessary due to unavoidable permanent impacts, and actual wetland impacts could vary widely depending on the locations of specific project components. This conclusion would not change even if six NY Bight projects are constructed all at once or staggered. Therefore, onshore wetland habitat impacts are expected to range from negligible to moderate and would depend on specific construction activities, project component siting, and their proximity to wetlands. If construction of the onshore project components of six NY Bight projects are staggered, then there could be less of an effect on wetlands in the short term than if all six NY Bight projects were constructed at once. In context of reasonably foreseeable environmental trends, BOEM anticipates the impact of six NY Bight projects to the cumulative accidental release impacts would be undetectable; the contribution to cumulative land disturbance impacts would be noticeable on wetlands if greater impacts are incurred based on project-specific siting.

3.5.8.4.4 Conclusions

Impacts of Alternative B. In summary, construction and installation, O&M, and conceptual decommissioning of either one NY Bight project or six NY Bight projects under Alternative B, would likely have **negligible** to **moderate** impacts on wetlands, depending on the area of wetland affected, the types of wetlands affected, and duration of impact. For projects that would incur wetland impacts, the requirements set forth in the CWA Section 404(b)(1) Guidelines of avoidance, minimization, and compensatory mitigation would likely reduce project impacts on wetlands.

Cumulative Impacts of Alternative B. BOEM anticipates that the cumulative impacts on wetlands in the geographic analysis area would likely be **negligible** to **moderate** under six NY Bight projects. In context of other reasonably foreseeable environmental trends, the impacts contributed by six NY Bight projects to the overall impacts on wetlands could be noticeable, depending on site-specific project component siting relative to wetland locations.

3.5.8.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Wetlands

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight Area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action. BOEM notes that federal, state, and local wetland permitting that would apply to any of the alternatives would contain mitigation measures and permit terms and conditions that would avoid and minimize wetlands impacts and, if needed, compensate for any permanent wetland function loss.

3.5.8.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. However, BOEM has not identified any previously applied AMMM measures for wetlands; therefore, the impacts on wetlands under Sub-alternative C1 are the same as for Alternative B.

3.5.8.5.2 Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any AMMM measures that have not been previously applied for wetlands; therefore, the impacts on wetlands under Sub-alternative C2 are the same as for Sub-alternative C1 and Alternative B.

3.5.8.5.3 Conclusions

Impacts of Alternative C. No AMMM measures are identified for wetlands under Sub-alternative C1 or Sub-alternative C2. Therefore construction and installation, O&M, and conceptual decommissioning activities from either one NY Bight project or six NY Bight projects would be the same as for Alternative B. Impacts on wetlands would likely be **negligible** to **moderate**, depending on the area of wetland affected, the types of wetlands affected, and duration of impact. For projects that would incur wetland impacts, the mitigation requirements set forth in the CWA Section 404(b)(1) guidelines of avoidance, minimization, and compensatory mitigation would likely reduce project impacts on wetlands.

Cumulative Impacts of Alternative C. BOEM anticipates that the cumulative impacts on wetlands in the geographic analysis area would likely be **negligible** to **moderate** under Sub-alternative C1 and Sub-alternative C2. In context of other reasonably foreseeable environmental trends, the impacts contributed by one NY Bight project or six NY Bight projects to the overall impacts on wetlands could be noticeable, depending on site-specific project component siting relative to wetland locations.

3.5.8.6 Recommended Practices for Consideration at the Project-Specific Stage

In addition to the AMMM measures identified under Alternative C, BOEM is recommending lessees consider analyzing the RPs in Table 3.5.8-7 to further reduce potential wetlands impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.5.8-7. Recommended practices for wetlands impacts and related benefits

Recommended Practice	Potential Benefit
MUL-18: Coordinate transmission infrastructure among projects such as by using shared intra- and interregional connections, meshed infrastructure, or parallel routing.	Using shared transmission infrastructure or following parallel routing with existing and proposed infrastructure could result in the consolidation of export cables from the six NY Bight projects into a reduced number of cable corridors, which could reduce the potential for wetland habitat loss. BOEM also acknowledges that easements and ROWs continue onshore and encourages the use of shared onshore infrastructure where practicable to minimize potential impacts on wetlands.
MUL-23: Avoid or reduce potential impacts on important environmental resources by adjusting project design.	Adjusting project design to minimize impacts on environmental resources, such as by siting onshore infrastructure to avoid wetlands or using HDD to pass underneath wetlands, could reduce overall wetland impacts. The site selection of onshore landfalls and substation locations and the onshore cable routes would have the highest influence on the magnitude of impacts on wetlands.

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3.6 Socioeconomic Conditions and Cultural Resources

3.6.3 Demographics, Employment, and Economics

This section discusses the demographics, employment, and economic characteristics in the geographic analysis area and the potential impacts from the Proposed Action, alternatives, and ongoing and planned activities. The geographic analysis area, as shown on Figure 3.6.3-1, includes the counties where onshore infrastructure and potential port cities would be located, as well as the counties closest to the NY Bight lease areas. These counties are the most likely to experience beneficial or adverse economic impacts from the NY Bight projects. Potentially affected counties in New Jersey include Atlantic, Burlington, Camden, Cape May, Cumberland, Essex, Gloucester, Hudson, Middlesex, Monmouth, Ocean, Salem, and Union Counties. Potentially affected counties in New York include Albany, Kings, Nassau, New York, Queens, Rensselaer, Richmond, and Suffolk Counties. This analysis also considers counties that may be affected by visual impacts or impacts on recreation and tourism that may have economic consequences (e.g., on property values, tourism, or recreation), which are discussed in separate sections of this Final PEIS. Refer to Appendix B, *Supplemental Information and Additional Figures and Tables,* for detailed demographic, housing, and employment information for the counties within the geographic analysis area.

The demographics, employment, and economic impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

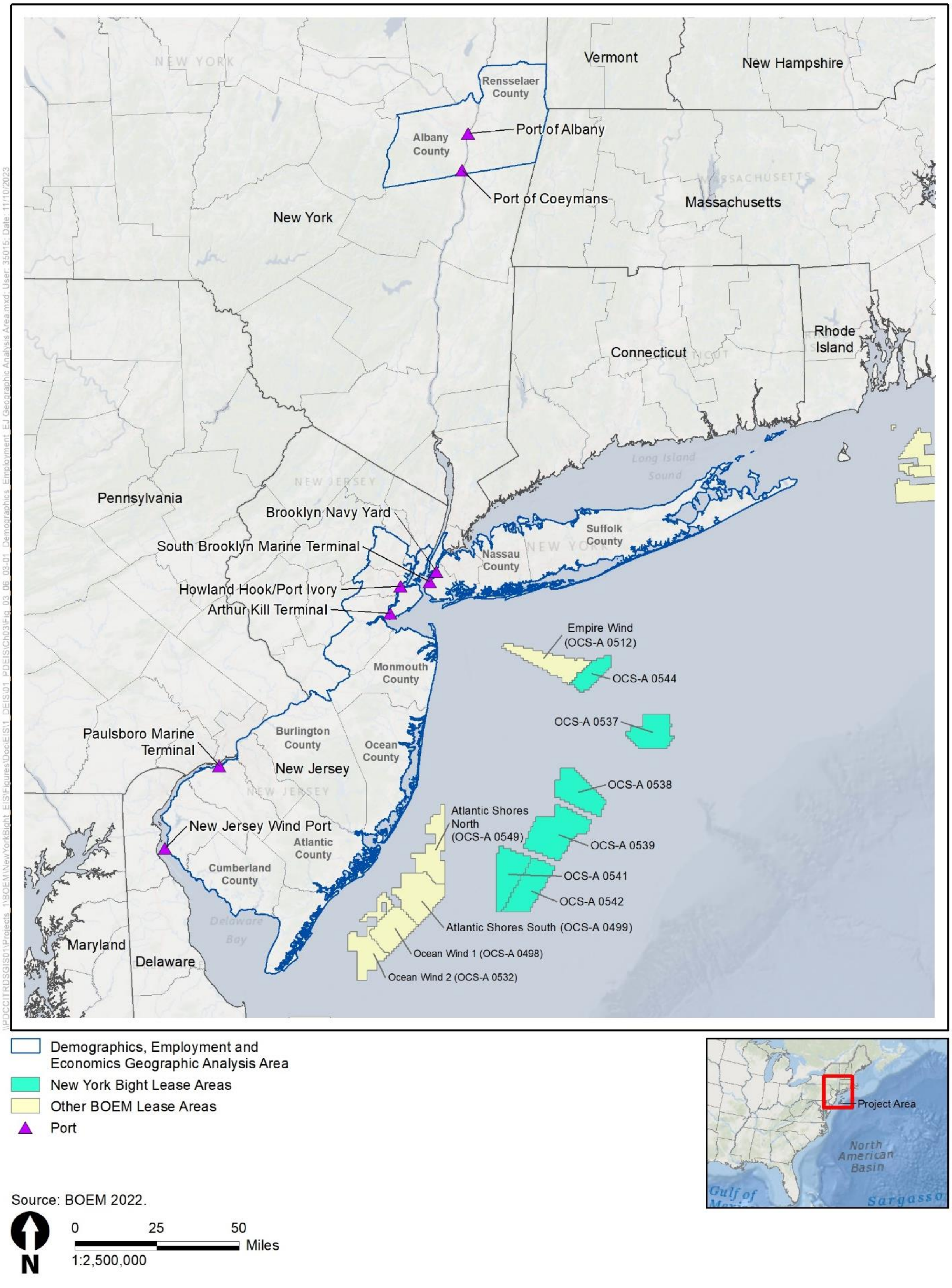


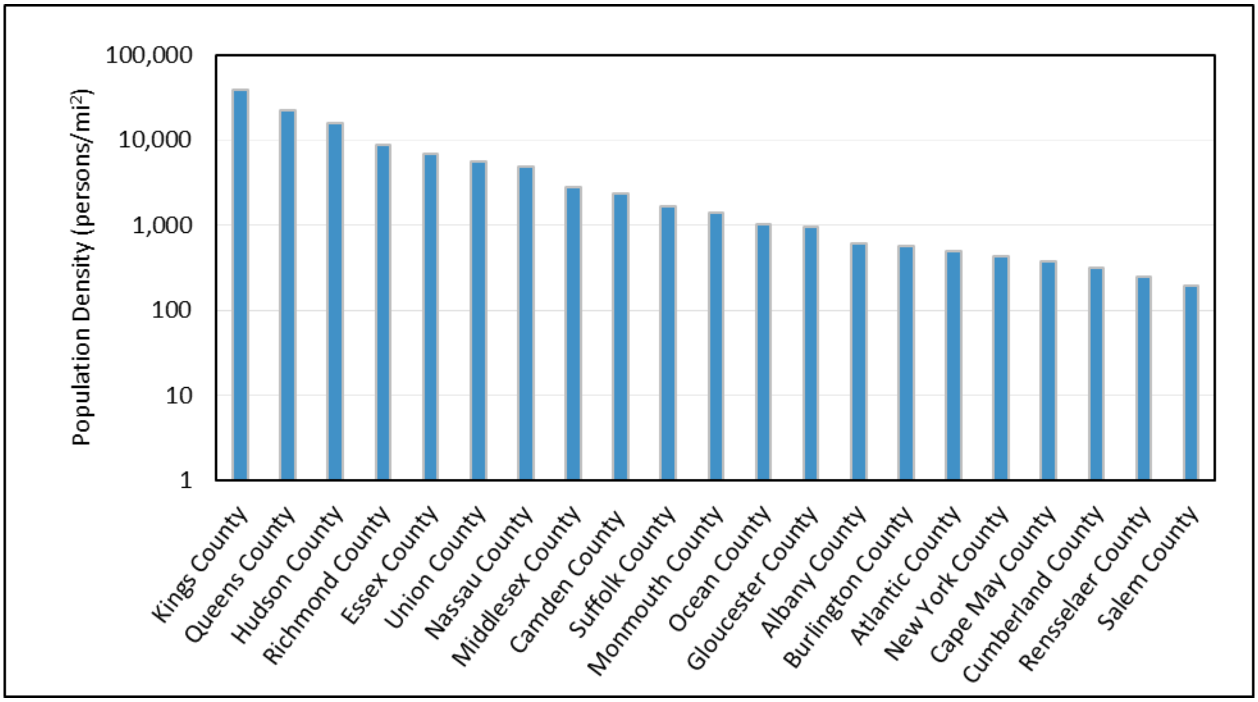
Figure 3.6.3-1. Demographics, employment, and economics geographic analysis area

3.6.3.1 Description of the Affected Environment and Future Baseline Conditions

3.6.3.1.1 Demographics

Population

The total population within the geographic analysis area is approximately 15.6 million, with the 8 potentially affected New York counties comprising approximately 9.5 million and the 13 New Jersey counties comprising about 6.1 million. The population within each county varies widely, ranging from 160,000 to 2.7 million in New York and 65,000 to 863,000 in New Jersey (U.S. Census Bureau 2020; Appendix B, Table B.4-1). Population densities are more comparable. The three most densely populated New York counties (Kings, Queens, and Richmond) range from 8,618 to 39,438 persons per square mile; the top three New Jersey counties (Hudson, Essex, Union) range from 5,569 to 15,692 persons per square mile. The two least densely populated counties were inland counties: Rensselaer in New York and Salem in New Jersey, respectively at 247 and 195 persons per square mile (Figure 3.6.3-2).



Source: U.S. Census Bureau 2020.

Figure 3.6.3-2. Population density in New York and New Jersey counties (2020)

Populations trended upwards from 2000 to 2020 for all New York and nearly all New Jersey counties (Appendix B, Table B.4-1). In New Jersey, two counties showed a loss in population: Cape May County between 2000 and 2020, and Cumberland County between 2010 and 2020. Overall, from 2010 to 2020 the population growth of New York and New Jersey counties averaged 4.8 percent and 4.2 percent, respectively; from 2000 to 2020 population growth respectively averaged 7.8 percent and 8.9 percent (U.S. Census Bureau 2000, 2010, 2020).

Population Age Distribution

The age profiles for 2019 for both New York and New Jersey counties show fair consistency across age groups, with the exception of the median age (Appendix B, Table B.4-2). The 0–17 age group is an important demographic as it reflects the opportunity to train and educate the next generation of workers. This age group ranges from 14 percent to 24 percent of the population across all counties in the geographic analysis area, averaging 21 percent. The 18–34 age group ranged from 18 percent to 31 percent, averaging 23 percent. The 35–64 age group ranged from 35 percent to 42 percent, averaging 40 percent. The combined 18–64 age group, which represents the available prime working age population, ranged from 54 percent to 69 percent of the population, averaging 62 percent. The 65+ age group are generally considered retirement age population and ranged from 12 percent to 18 percent, with one outlier at 26 percent, and averaging 23 percent (U.S. Census Bureau 2019).

3.6.3.1.2 Housing

The number of housing units for New York counties in 2019 ranged from 73,011 units to 1,044,493 units, with a median of 524,266 units. The number of housing units for New Jersey counties in 2019 ranged from 27,595 units to 317,314 units, with a median of 202,267 units. The median owner-occupied value per unit for New York counties ranged from $188,700 to $987,700, with a median value of $493,500. The median owner-occupied value per unit for New Jersey counties ranged from $162,500 to $421,900, with a median value of $279,000 (U.S. Census Bureau 2019; Appendix B, Table B.4-4).

Occupancy in 2019 was comparably high for both New York (85 percent to 95 percent, averaging 90 percent) and New Jersey (78 percent to 94 percent, averaging 89 percent) counties (U.S. Census Bureau 2019; Appendix B, Table B.4-4). The figures for New Jersey omit data from Cape May County because of its seasonal population dynamics: some 95,000 year-long residents lived in Cape May County in 2020 (U.S. Census Bureau 2020), but during summer, the population increases to at least eight times that of the permanent winter population due to tourism (Cape May County Planning Board 2022).

The percentages of housing units that are seasonally occupied vary widely between counties. One factor is that tourism and recreation are key economic drivers of coastal counties, whereas the inland counties included in the geographic analysis area (where potential ports are located) are not as dependent on seasonal industries. Thus, Gloucester County and Salem County have seasonally occupied housing unit percentages of 0.3 percent and 0.7 percent, while Atlantic, Ocean, and Cape May Counties have seasonally occupied housing unit percentages of 13.4 percent, 13.8 percent, and 50.8 percent, respectively (U.S. Census Bureau 2019; Appendix B, Table B.4-4).

In 2019, average rents in New Jersey counties in the geographic analysis area ranged from $836 per month to $1,349 per month, with a statewide median rent of $1,087 per month for renter-occupied housing units. Average rents in New York counties in the geographic analysis area in 2019 (with the exception of Queens County, for which no data were available) ranged from $822 per month to $1,651 per month, with a statewide median rent of $1,303 per month (U.S. Census Bureau 2019).

3.6.3.1.3 Employment

Regional Employment

The New York metropolitan area is a major hub of the Nation's commerce. In 2019 total employment in the geographic analysis area counties of New York amounted to approximately 4.25 million jobs and in New Jersey amounted to 3.10 million jobs (U.S. Census Bureau 2019). The number of jobs varied widely by county, ranging from 85,822 to 1,851,947 jobs in New York counties and 31,221 to 429,146 jobs in New Jersey counties. Per capita income in 2019 ranged from $60,231 to $116,100 for counties in New York in the geographic analysis area, compared to a statewide average of $83,134. Per capita income in 2019 ranged from $54,149 to $99,733 for counties in New Jersey in the geographic analysis area, compared to a statewide average of $74,492 (Table 3.6.3-1).

Table 3.6.3-1. New York and New Jersey employment, unemployment, per capita income, and population living below poverty level (2019)

Jurisdiction	Total Employment	Per Capita Income	Unemployment Rate (%)	Population Living Below Poverty Level (%)
New York Counties				
Albany County	168,609	$66,252	4.5	7.1
Kings County	1,308,399	$60,231	6.2	15.9
Nassau County	716,106	$116,100	3.9	3.8
New York County	955,427	$86,553	5.2	11.8
Queens County	1,851,947	$96,631	3.6	12.2
Rensselaer County	85,822	$68,991	4.7	7.8
Richmond County	225,088	$82,783	4.6	9.4
Suffolk County	785,803	$101,031	4.2	4.5
New Jersey Counties				
Atlantic County	139,427	$62,110	8.4	9.9
Burlington County	241,940	$87,416	5.6	4.1
Camden County	267,725	$70,451	6.6	9.1
Cape May County	45,904	$67,074	6.6	6.9
Cumberland County	66,521	$54,149	7.3	11.9
Essex County	411,493	$61,510	8.1	12.8
Gloucester County	158,168	$87,283	5.5	4.4
Hudson County	377,168	$71,189	5.2	11.8
Middlesex County	429,146	$89,533	5.2	6.2
Monmouth County	335,725	$99,733	4.9	4.7
Ocean County	275,104	$70,909	5.1	6.5
Salem County	31,221	$66,842	6	8.6
Union County	299,082	$80,198	5.7	6.9

Source: U.S. Census Bureau 2019.

The New York metropolitan area has a highly diversified economic base. Data on the contribution to the New York and New Jersey GDP for 16 commercial sectors show the breadth of the region's employment summarized at the county level in Table 3.6.3-2. Education/Health Care/Social Assistance is the top commercial sector. Professional/Scientific/Technical Services, Retail Trade, and Finance/Insurance/Real

Estate rounded out the top four positions, which in total accounted for some 60 percent of the total ocean economy employment of the counties.

Table 3.6.3-2. New York and New Jersey employment contribution by commercial sector (2019)

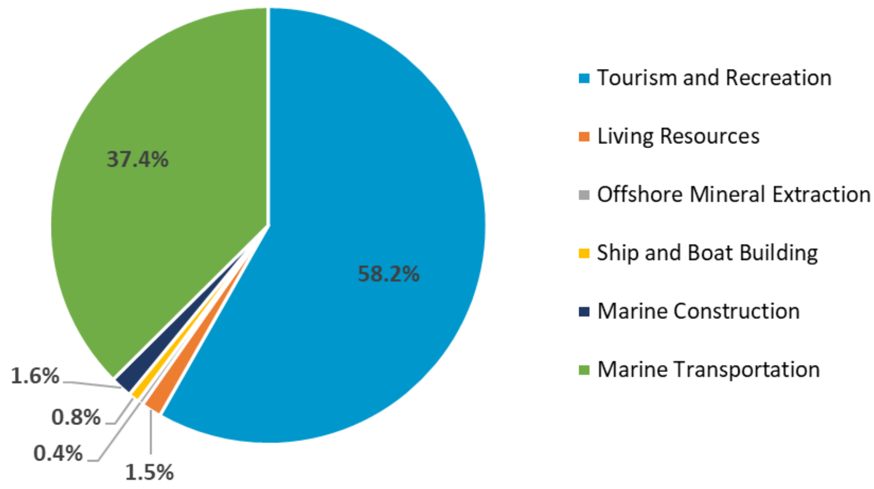
Commercial Sector	New York	New Jersey
Education, Health Care, Social Assistance	29.2%	26.4%
Professional, Scientific, Technical	11.4%	9.6%
Finance, Insurance, Real Estate	10.8%	9.0%
Retail Trade	10.0%	12.1%
Accommodations and Food	7.1%	6.9%
Construction	6.1%	6.8%
Transportation and Warehouse	6.0%	6.5%
Manufacturing	4.5%	7.9%
Information	4.2%	2.8%
Administration, Support, Waste Management	4.0%	4.7%
Arts/Entertainment /Recreation	3.0%	2.5%
Wholesale Trade	2.7%	3.5%
Utilities	0.6%	0.9%
Agriculture, Forestry, Fishing, Hunting	0.2%	0.3%
Management of Companies	0.1%	0.2%
Mining, Quarrying, Oil & Gas	0.0%	0.0%

Source: U.S. Census 2019.

As shown in Table 3.6.3-1, the lowest unemployment levels for New York counties were for Queens County (3.6 percent) and Nassau County (3.9 percent); the highest unemployment levels were in New York County (5.2 percent) and Kings County (6.2 percent) (U.S. Census Bureau 2019). The populations living below poverty levels were lowest for Nassau (3.8 percent) and Suffolk (4.5 percent) Counties and were highest in Queens (12.2 percent) and Kings (15.9 percent) Counties. The lowest unemployment levels for New Jersey counties were in Monmouth, Middlesex, Ocean, and Hudson Counties and ranged from 4.9 percent to 5.2 percent; the highest unemployment levels were in Atlantic (8.4 percent), Essex (8.1 percent), and Cumberland (7.3 percent) Counties. The populations living below poverty levels were lowest for Burlington (4.1 percent) and Gloucester (4.4 percent) Counties and were highest in Hudson (11.8 percent), Cumberland (11.9 percent), and Essex (12.8 percent) Counties (U.S. Census Bureau 2019).

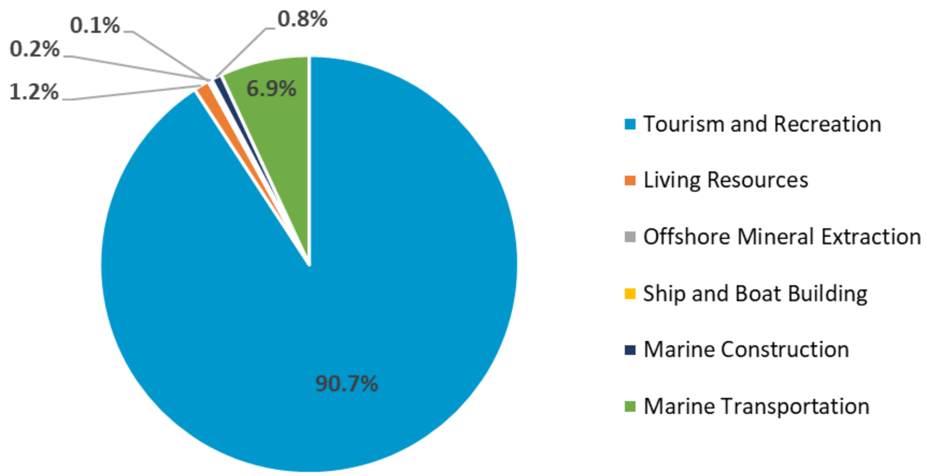
Ocean Industry Employment

Figure 3.6.3-3 presents the contribution of six ocean industry sectors (marine construction, living resources, offshore mineral extraction, ship and boat building, tourism and recreation, and marine transportation) to the ocean industry employment in 2019 for the New Jersey counties within the geographic analysis area. Figure 3.6.3-4 presents the same data for New York counties. Total ocean industry employment for New York counties was 342,047; for New Jersey it was 149,649 (NOEP 2022; Appendix B, Table B.4-8). Considering data for both states within the geographic analysis area, tourism and recreation accounts for 81 percent of the ocean industry economy, marine transportation accounts for 16 percent, and the remaining 3 percent is composed of the other four ocean industry sectors.



Source: NOEP 2022.

Figure 3.6.3-3. Ocean economy employment, New Jersey counties



Source: NOEP 2022.

Figure 3.6.3-4. Ocean economy employment, New York counties

3.6.3.1.4 Economics

Table 3.6.3-3 presents the data on number of establishments, employment, wages, and GDP attributed to the ocean industry sector for the counties in the geographic analysis area of New York (NOAA 2022). Similar to ocean industry-related employment for New York counties, the number of establishments, wages, and GDP are driven by two ocean industry sectors—tourism and recreation, and marine transportation.

Table 3.6.3-3. Total number of establishments, wages, and GDP for ocean industry economy of New York (2019)

Ocean Sector	Establishments	Employment	Wages, $M	GDP, $M	% NY Coastal Ocean Sector	
					Wages	GDP
Marine Construction	142	2,593	$198	$479	1.9%	1.5%
Living Resources	623	4,264	$8	$497	1.4%	1.6%
Offshore Mineral Extraction	35	90	$16	$14	0.1%	0.0%
Ship and Boat Building	4	190	$12,857	$30	0.1%	0.1%
Tourism and Recreation	20,195	330,693	$696	$29,194	92%	93%
Marine Transportation	397	11,847	$14,047	$1,116	5.0%	3.6%
All Ocean Sectors, Geographic Analysis Area Counties	21,445	349,677	$16,111	$31,330	100%	100%
All Ocean Sectors, State	24,019	398,514	$273	$35,109	87%	89%

Source: NOAA 2022.

Table 3.6.3-4 presents the data on number of establishments, employment, wages, and GDP attributed to the ocean industry sector for the counties in the geographic analysis area of New Jersey for the same six ocean industry sectors (NOAA 2022). Again, two ocean industry sectors—tourism and recreation and marine transportation—drive the ocean industry-related employment, number of establishments, wages, and GDP in New Jersey.

Table 3.6.3-4. Total number of establishments, wages, and GDP for ocean industry economy of New Jersey (2019)

Ocean Sector	Establishments	Employment	Wages, $M	GDP, $M	% NJ Coastal Ocean Sector	
					Wages	GDP
Marine Construction	81	1,869	$183	$369	4.9%	5.6%
Living Resources	152	890	$40	$101	1.1%	1.5%
Offshore Mineral Extraction	0	Not applicable	$0	$0	0.0%	0.0%
Ship and Boat Building	0	Not applicable	$0	$0	0.0%	0.0%
Tourism and Recreation	6,501	81,694	$1,951	$3,813	53%	58%
Marine Transportation	486	31,320	$1,537	$2,299	41%	35%
All Ocean Sectors, Geographic Analysis Area Counties	7,220	115,773	$3,711	$6,582	100%	100%
All Ocean Sectors, State	9,349	169,654	$6,689	$11,857	55%	56%

Source: NOAA 2022.

3.6.3.2 Impact Level Definitions for Demographics, Employment, and Economics

Definitions of adverse impact levels are provided in Table 3.6.3-5. Beneficial impacts on demographics, employment, and economics are described using the definitions described in Section 3.3.2 (see Table 3.3-1).

Table 3.6.3-5. Adverse impact level definitions for demographics, employment, and economics

Impact Level	Definition
Negligible	There would be no measurable impacts, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Adverse impacts would not disrupt the normal or routine functions of the affected activity or geographic place.
Moderate	The affected activity or geographic place would have to adjust somewhat to account for disruptions due to impacts of the project.
Major	The affected activity or geographic place would experience disruptions to a degree beyond what is normally acceptable.

Cable emplacement and maintenance, land disturbance, lighting, noise, port utilization, presence of structures, and traffic are contributing IPFs to impacts on demographics, employment, and economics. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.6.3-6.

Table 3.6.3-6. Issues and indicators to assess impacts on demographics, employment, and economics

Issue	Impact Indicator
Impacts on particular demographic and employment sectors of the economy	Qualitative assessment that considers the context and intensity of impacts resulting from the particular IPF on the functioning of the economy (e.g., decrease in full-time equivalent jobs, labor income, gross domestic product, and gross output)

3.6.3.3 Impacts of Alternative A – No Action – Demographics, Employment, and Economics

When analyzing the impacts of the No Action Alternative, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities as the baseline conditions for demographics, employment, and economics. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore-wind and offshore wind activities as described in Appendix D, *Planned Activities Scenario*.

3.6.3.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for demographics, employment, and economics would continue to follow current regional levels and trends and respond to IPFs introduced by other ongoing activities. Tourism, recreation, and marine industries (e.g., fishing) would continue to be important components of the regional economy. Ongoing non-offshore-wind activities in the geographic analysis area that contribute to impacts on demographics, employment, and economics include growth in onshore development; ongoing installation of submarine cables and pipelines; periodic channel dredging; maintenance of piers, pilings, seawalls, and buoys; ongoing commercial shipping; continued port upgrades and maintenance; and ongoing effects from climate change (e.g., damage to property and coastal infrastructure) (see Appendix D for a description of ongoing activities). These ongoing activities contribute to numerous IPFs including cable emplacement and maintenance, which could disrupt fishing; land disturbance, which supports local population growth, employment, and economies; lighting and noise, which can affect residential and other sensitive populations; port utilization, which can affect jobs, populations, and economies; presence of structures, which can affect fishing, navigation, and coastal views; and marine traffic, which can affect commercial fishing/shipping and recreation and tourism economies.

The socioeconomic impact of ongoing activities varies depending on each activity. Activities that generate economic activity, such as port maintenance and channel dredging, would generally benefit the local economy by providing job opportunities and generating indirect economic activity from suppliers and other businesses that support activity along coastal areas. Conversely, ongoing activities that disrupt economic activity, such as climate change, may adversely affect businesses, resulting in impacts on employment and wages. Coasts are sensitive to sea level rise, changes in the frequency and intensity of storms, increases in precipitation, and warmer ocean temperatures. Sea level rise and increased storm frequency and severity could result in property or infrastructure damage, increased insurance cost, and reduction in the economic viability of coastal communities. Impacts on marine life due to ocean acidification, altered habitats and migration patterns, and disease frequency would affect industries that rely on these species. The impacts of climate change are likely over time to worsen problems that coastal areas already face.

Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on demographics, employment, and economics include ongoing construction of Ocean Wind 1 (OCS-A 0498) and Empire Wind 1 and 2 (OCS-A 0512). Ongoing construction of Ocean Wind 1 and Empire Wind 1 and 2 would have the same type of impacts on demographics, employment, and economics that are described in Section 3.6.3.3.2, *Cumulative Impacts of the No Action Alternative* for all ongoing and planned offshore wind activities in the geographic analysis area.

3.6.3.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impact of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects). Offshore wind is a new industry for the Atlantic states and the nation. Although most offshore wind component manufacturing and installation capacity exists outside of the U.S., some studies acknowledge that domestic capacity is poised to increase (BVG 2017; NREL 2023).

A BVG Associates Limited study (BVG 2017) estimated that the percentage of associated jobs that would be sourced in the United States during the initial implementation of offshore wind projects along the U.S. northeast coast would range from 35 to 55 percent. The proportion of jobs projected to be associated with offshore wind within the United States is approximately 65 to 75 percent from 2030 through 2056. Overseas manufacturers of components and specialized ships based overseas would comprise the rest of the offshore wind–related jobs, located outside the United States (BVG 2017).

The American Wind Energy Association (AWEA; now known as American Clean Power) estimates that the offshore wind industry will invest between $80 and $106 billion in U.S. offshore wind development by 2030, of which $28 to $57 billion will be invested within the United States. While most economic and employment impacts would be concentrated in Atlantic coastal states where offshore wind development will occur, there would be nationwide effects as well (AWEA 2020). The AWEA base scenario assumes 20 GW of offshore wind power by 2030, domestic content of 30 percent in 2025, and of 50 percent in 2030; the high scenario assumes 30 GW of offshore wind power by 2030 and domestic content of 40 percent in 2025 and of 60 percent in 2030. Offshore wind energy development will support $14.2 billion in economic output and $7 billion in value added by 2030 under the base scenario and support $25.4 billion in economic output and $12.5 billion in value added under the high scenario.

Compared to the $14.2 to $25.4 billion in offshore wind economic output (AWEA 2020), the 2020 annual GDP for Atlantic states with planned offshore wind projects (Connecticut, Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina) ranged from $60.8 billion in Rhode Island to $1.74 trillion in New York (U.S. Bureau of Economic Analysis 2021) and totaled just over $5 trillion. The $14.2 to $25.4 billion in offshore wind industry output would represent 0.3 to 0.5 percent of the combined GDP of these states.

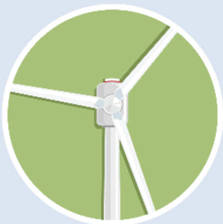
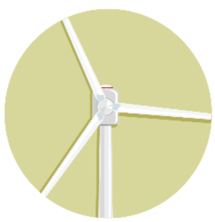
The AWEA estimates that in 2030, offshore wind would support 45,500 (base scenario) to 82,500 (high scenario) full-time equivalent (FTE) jobs nationwide. The Responsible Offshore Development Alliance (RODA) in 2020 estimated that offshore wind projects would create 55,989 to 86,138 job-years through 2030 in construction and 5,003 to 6,994 long-term jobs in O&M (Georgetown Economic Services 2020).

In 2019, employment for New Jersey and New York counties within the geographic analysis area was approximately 3.0 million and 6.1 million jobs, respectively (Table B.4-5 in Appendix B). While the extent to which there will be impacts on the geographic analysis area is unclear due to the geographic versatility of offshore wind jobs, a substantial portion of the jobs supporting planned offshore wind projects in New Jersey and New York would likely be within commuting distance of ports.

Some local economic activity has already begun for the anticipated offshore wind industry. The establishment of a New York State Advisory Council on Offshore Wind Training Institute was launched to develop a plan for deploying public funds and has issued the first solicitation for $3 million to support early training and skills development for disadvantaged communities. The developers of the Sunrise Wind project (OCS-A 0487) have invested $10 million in a National Offshore Wind Training Center at Suffolk County Community College on Long Island to train and certify workers. The Center of Excellence for Offshore Energy at State University of New York’s Maritime College was launched with a grant from New York State to develop classroom and online training programs (NYSERDA 2021).

Ongoing and planned offshore wind activities that may contribute to impacts on demographics, employment, and economics in the geographic analysis area are listed in Table 3.6.3-7.

Table 3.6.3-7. Ongoing and planned offshore wind that may contribute to impacts on demographics, employment, and economics

Ongoing/Planned	Projects by Region
Ongoing – 3 projects[1] 	**NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 3 projects[2] 	**NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499)

NJ = New Jersey; NY = New York
[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.
[2] Status as of September 20, 2024.

In addition to the regional economic impact of a growing offshore wind industry, BOEM expects ongoing and planned offshore wind activities to affect demographics, employment, and economics through the following primary IPFs.

Cable emplacement and maintenance: Offshore cable emplacement for offshore wind activities could impact commercial fishing and for-hire recreational fishing during cable installation and maintenance, temporarily causing commercial and recreational fishing vessels to relocate away from work areas, disrupting fish stocks, and reducing income or increasing catch per unit effort costs. (See Section 3.6.1.3.2 for additional details.) The economic impact on commercial/for-hire recreational fishing would likely be short term and minor.

Land disturbance: Land disturbance could result in localized, short-term, adverse revenue losses for businesses near construction sites due to construction impacts (e.g., increased noise, traffic, and access disturbances) and beneficial impacts for businesses supporting construction activities. Conceptual decommissioning would create an increased economic activity compared to the O&M phase but is unlikely to cause additional land disturbance. Adverse and beneficial impacts on employment, wages, and GDP would be localized, short term, and minor.

Lighting: Offshore WTGs require aviation warning lighting that could have economic impacts if the lighting influences visitors and residents in selecting coastal locations in which to reside or to visit. No readily available studies characterize the impacts of nighttime offshore lighting on economic activity. Studies cited in Section 3.6.8, *Recreation and Tourism*, suggest that WTGs visible from more than 15 miles (24.1 kilometers) away would have negligible effects on businesses dependent on recreation and tourism activity (Parsons and Firestone 2018).[1] At this distance, the percentage of respondents who indicated that their experience would be improved by the presence of WTGs was the same as the percentage of respondents who indicated that their experience would be worsened by the WTGs. While some WTGs associated with ongoing and planned offshore wind projects in the geographic analysis area would be within 10 miles of shore, the majority of WTGs would be more than 15 miles from coastal locations. The implementation of ADLS would activate a hazard lighting system in response to detecting nearby aircraft and, if ADLS is implemented, would result in shorter-duration night sky impacts. Due to the distance of the WTGs from shore and the expected implementation of ADLS, ongoing and planned offshore wind projects would result in overall negligible impacts. Nighttime transit or construction lighting may be visible from some coastal residences and businesses. Conceptual decommissioning may increase nighttime lighting from vessels in transit but would result in reduced lighting impacts from WTG removals. However, the contribution from offshore wind to existing activity is small and there would likely be a negligible impact on demographics, employment, and economics.

Noise: Noise from vessel traffic during the maintenance and construction phases could affect species important to commercial/for-hire fishing, recreational fishing, and whale watching. Offshore wind-related construction noise from pile-driving, cable laying and trenching, and vessels could drive away species important to tour boat or for-hire recreational fishing businesses. Noise from pile-driving could also affect fish populations important to commercial fishing and marine recreational businesses. These impacts would be greater if multiple construction activities occur in close spatial or temporal proximity. Impacts would likely be temporary, mainly occurring during surveying and construction and, therefore, are expected to be minor. Impacts during O&M would likely be negligible. Onshore construction noise could temporarily inconvenience visitors, workers, and residents, resulting in reduction of economic activity for businesses near cable landfall or substation sites or port improvements. During conceptual decommissioning vessel traffic noise would occur as well as offshore activity-related noise from WTG removal. The location of onshore activities is unknown, so noise impacts from onshore construction currently cannot be determined reliably. Impacts on demographics, employment, and economics from noise is expected to be intermittent, short term, and negligible to minor, like those of typical onshore utility construction activities.

Port utilization: Offshore wind development would require support from nearby port facilities and may need port expansion and improvements. Development activities would bolster port investment and employment, jobs and revenue in port-supporting industries, and port construction/improvement businesses. Port utilization would require a trained workforce for the offshore wind industry, providing local and regional employment and economic activity for onshore and offshore workers. Improvements to existing ports and channels would be beneficial to other port activity. In the O&M phase, the level of port activity would likely be lower but more consistent. Offshore wind development could result in increased demand for port service and result in port expansions. Port construction activities could result in minor short- to long-term adverse impacts on marine transportation and commercial/for-hire/recreational fishing. Overall, however, port utilization from offshore wind is anticipated to result in

[1] This study was based on 100 WTGs using a 0.75-mile grid spacing and a maximum rotor height of 574 feet. The study used visual simulations under clear, hazy, and nighttime (lighted) conditions.

minor beneficial impacts on demographics, employment, and economics both from short-term creation of construction jobs (a few years to a decade, particularly between 2023 and 2030) that likely can be supported by the existing workforce, from minor long-term (decades) job creation during the O&M phase, and from short-term job creation during conceptual decommissioning (a few years to a decade).

Presence of structures: Up to 697 WTGs are projected for the New York/New Jersey region, without any NY Bight development (Appendix D). Businesses that are most likely to be affected by presence of structures include commercial fishing, for-hire recreational fishing, recreational fishing (and for all three, particularly the fisheries using bottom gear) and marine recreation and tourism businesses. Marine transportation could also be affected. Impacts will include both short-term impacts during construction from noise and vessel traffic and long-term impacts from the physical presence of structures by creating areas that fishing vessels may avoid due to safety concerns or potential for gear damage. The areal extent of these areas will increase directly with the number of WTGs installed but will also depend on their location, spacing, and orientation. These potential adverse impacts can be temporary over a timescale of years and minor (e.g., those associated with structure installation) or can be long-term over a timescale of multiple decades and moderate (e.g., resulting from space-use conflicts for fishing or marine transportation). The presence of structures could produce beneficial fish aggregation and reef effect impacts around marine structures for businesses that cater to migratory species and offshore recreational fishing. Damage to gear is a concern and could be worsened if fish aggregate around offshore infrastructure and fishermen engage in higher risk fishing patterns near WTGs. Given the distances from shore, the attraction of recreational anglers to offshore wind structures is more likely to change recreational fishing patterns than to result in an overall increase in recreational fishing. Another beneficial impact could be new business opportunities, e.g., windfarm tourism for those interested in a close-up experience with offshore wind structures, as has occurred for the Block Island Wind Farm. Both adverse and beneficial impacts would be reversed following conceptual decommissioning and WTG removal.

Impacts on commercial fisheries and for-hire recreational fishing are of most concern, with impacts anticipated to range from negligible to major for commercial fisheries and moderate impacts with potential minor beneficial impacts on for-hire recreational fishing (see Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*). These industries represent only a part of the ocean economy that would be affected by offshore wind, and overall impacts on employment and economics would be minor.

Traffic: Offshore wind construction and conceptual decommissioning and, to a lesser extent, offshore wind operations would generate increased vessel traffic. The magnitude of increased vessel traffic will depend on vessel traffic volumes generated by each offshore wind project and number of WTGs; the extent of concurrent or sequential construction of wind energy projects; and the ports selected for each project. Increased vessel traffic will occur to, from, and in supporting ports and in offshore construction areas. Vessel traffic could adversely affect marine transportation, commercial fishing, and recreational traffic. Impacts of short-term, increased vessel traffic during construction could include increased vessel traffic congestion, delays at ports, and a risk for collisions between vessels. Increased vessel traffic would be localized near affected ports and offshore construction areas. Congestion and delays could increase fuel costs (i.e., for vessels forced to wait for port traffic to pass) and decrease productivity for commercial shipping, fishing, and recreational vessel businesses, whose income depends on the ability to spend time out of port. Collisions could lead to vessel damage and spills, which could have direct costs (i.e., vessel repairs and spill cleanup), as well as indirect costs from damage caused by spills. Beneficially, this increased traffic would support increased employment and economic activity for marine transportation related to offshore wind and supporting businesses and investment in ports.

Beneficial and adverse impacts will be greatest during construction and installation and cover a span of a few years to a decade. The far longer phase of O&M will produce lower and more consistent vessel traffic. Conceptual decommissioning would create a short-term increase in vessel traffic but would be at a lower level of activity than during the construction phase. The increase in vessel trips from offshore wind activity is anticipated to be largely indiscernible from existing levels of vessel traffic. Offshore wind traffic would likely result in short-term, negligible to minor impacts and long-term minor beneficial impacts on employment, wages, and the economy.

3.6.3.3.3 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, the demographic and economic trends from ongoing non-offshore-wind activities and ongoing offshore wind construction in the geographic analysis area would continue. Tourism and recreation and marine industries such as marine transportation would continue to be important components of the regional economy. BOEM anticipates that the No Action Alternative would likely have a **negligible** to **minor** impact on the demographics, employment, and economy of the geographic analysis area.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, ongoing and planned offshore wind and non-offshore-wind activities would affect ocean-based employment and economics, driven primarily by the continued operation of existing marine industries, especially recreation/tourism and marine shipping. The influence of planned offshore wind development, representing a significant investment in energy production, still presents a small impact in the geographic analysis area whose combined annual state GDPs runs to $2.6 trillion and supports nearly 7.5 million jobs. Although there may be adverse impacts associated with planned offshore wind activities on the region's demographics, employment, and economics, there are also beneficial impacts resulting from these same activities. BOEM concludes the cumulative impact of planned offshore wind development, in combination with ongoing activities, would likely have a **negligible** to **minor** impact and **minor beneficial** impacts on demographics, employment, and economics.

3.6.3.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Demographics, Employment, and Economics

3.6.3.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. The development of a single project within the NY Bight lease areas without AMMM measures would result in impacts similar to those described in Section 3.6.3.3.2, *Cumulative Impacts of the No Action Alternative*. Accordingly, the discussion below does not repeat the analyses supplied in Section 3.6.3.3.2 but describes where impacts may differ and reiterates the conclusions of those analyses.

Cable emplacement and maintenance: The development of a single NY Bight project would result in seafloor disturbance due to the installation of interarray and export cables. Cable emplacement could prevent deployment of fixed and mobile fishing gear in limited parts of the NY Bight area from one day up to several months (if simultaneous lay and burial techniques are not used), which may result in the loss of access if alternative fishing locations are not available. The demographic, employment, and economic impact on commercial/for-hire fishing would be localized, short term, and minor.

Land disturbance: Land disturbance could result in localized, short-term, adverse revenue losses for businesses near construction sites and beneficial impacts for businesses supporting construction. During peak tourist season, construction-related impacts associated with land disturbance, including road construction along the offshore export cable routes, could cause traffic delays and inconveniences to local businesses and residents. Temporary blockage of some roads during installation activities may restrict access to some local areas, although it is unlikely that access to specific establishments would be completely inhibited. Conceptual decommissioning is not anticipated to create additional land disturbance. Adverse and beneficial impacts on employment and wages would likely be localized, short term, and minor.

Lighting: One offshore wind project would add new sources of light to onshore and offshore areas, including from nighttime vessel lighting during construction and conceptual decommissioning and fixed lighting at onshore substations/converter stations, and on up to 280 WTGs and up to 5 OSSs. Because of the distance from shore (the NY Bight lease area nearest to shore is 20 nautical miles [37 kilometers] offshore), lighting on the WTGs and OSSs is not anticipated to have a substantial effect on views. However, as described in Section 3.6.9, *Scenic and Visual Resources*, in the absence of an ADLS system, there would be new, constant sources of nighttime lighting in view of the coastline for one NY Bight project. Nighttime lighting could have long-term impacts on demographics, employment, and economics if the lighting influences resident and visitor decisions in selecting coastal locations to visit or reside in. The addition of a single project in the NY Bight area would result in long-term, minor impacts, primarily as a result of offshore lighting on WTGs and OSSs.

Noise: Adverse offshore noise impacts on demographics, employment, and economics during construction/installation and conceptual decommissioning would likely be short term and minor; and impacts during O&M would be negligible. Adverse impacts of onshore noise would likely be intermittent, short term, and minor.

Port utilization: A single NY Bight project's activities at ports would support port investment and employment and would also support jobs and businesses in supporting industries and commerce. Several ports may support a single NY Bight project construction and O&M: Howland Hook/Port Ivory, Port of Albany, Port of Coeymans, South Brooklyn Marine Terminal, Brooklyn Navy Yard, Arthur Kill

Terminal in New York, and New Jersey Wind Port and Paulsboro Marine Terminal in New Jersey. These ports would require a trained workforce for the offshore wind industry including additional shore-based and marine workers that would contribute to local and regional economic activity.

The economic benefits would be greatest during construction and conceptual decommissioning when the most jobs and economic activity at ports supporting the NY Bight project would occur. During operations, activities would be concentrated where the single NY Bight project's onshore O&M facility would be located, and in other ports that may support one NY Bight project-related vessel traffic. Port utilization during construction/installation and conceptual decommissioning is expected to result in short-term minor beneficial impacts on demographics, employment, and economics, and minor beneficial long-term impacts during O&M.

Presence of structures: One NY Bight project would add up to 285 offshore wind structures with foundation scour protection and offshore export cable hard protection, which could affect marine-based businesses (i.e., commercial and for-hire recreational fishing businesses, offshore recreational businesses, and related businesses) through entanglement and gear loss/damage, navigational hazard and risk of allisions, fish aggregation, habitat alteration, and space use conflicts. Adverse impacts could include both short-term minor impacts during construction and long-term minor impacts from the creation of areas that fishing vessels would likely avoid due to the physical presence of structures. The presence of structures could produce long-term beneficial fish aggregation/reef effect impacts that are expected to be negligible to minor. Conceptual decommissioning and WTG removals would reverse both adverse and beneficial impacts from the presence of structures.

Stakeholders have raised questions regarding whether a NY Bight project could affect property values; any impacts on property values could also affect local property tax receipts. Hoen et al. (2013) analyzed housing prices from home sales occurring within 10 miles (16 kilometers) of onshore wind facilities in nine U.S. states and found no statistical evidence that home values were affected in the post-announcement/preconstruction or post-construction periods. The MassCEC also commissioned a report—Relationship between Wind Turbines and Residential Property Values in Massachusetts (Atkinson Palombo & Hoen 2014)—to study if home values were affected by their proximity to onshore WTGs. The study analyzed 122,198 home sales occurring between 1998 and 2012 of homes located within 5 miles (8 kilometers) of 41 Massachusetts wind turbines. Results of this study indicated that there were no effects on nearby home prices resulting from the development of a wind farm in a community. Brunner et al. (2024) found that onshore wind farms in the U.S. had temporary adverse impacts on property values within a limited distance (1–2 miles) and that wind farms further away did not adversely affect property values. A 2017 study found that when placed more than 8 miles (7 nautical miles; 13 kilometers) from shore, there is a minimal effect on vacation rental values associated with offshore wind farms (Lutzeyer et al. 2017). A 2018 study also found that there was no impact on property values when the wind farm is located 5.6 miles (9 kilometers) offshore (Jensen et al. 2018). Dong and Lang (2022) found that the Block Island Wind Farm did not adversely affect property values on Block Island or on the Rhode Island mainland. Since any NY Bight project will be located a substantial distance from shore—with the closest lease area 20 nautical miles from shore and the farthest lease area 35 nautical miles (40 miles) from shore—any impacts on property values are expected to be negligible.

Traffic: Vessel traffic from a single NY Bight project could adversely affect marine transportation, commercial/for-hire fishing, and recreational traffic due to associated increased vessel traffic congestion, delays at ports, and a risk for collisions between vessels. Increased traffic would support increased employment and economic activity for marine transportation and supporting businesses and investment in ports. The highest activity level would occur during the construction phase; lower activity would occur during the conceptual decommissioning phase; and the lowest activity would be during the much longer O&M phase. Offshore wind traffic would likely result in short-term negligible to minor adverse impacts and long-term minor beneficial impacts.

3.6.3.4.2 Impacts of Six Projects

The types of IPFs, impacts, and mechanisms that affect the demographics, employment, and economics of the geographic analysis area as described for one NY Bight project would be the same for six NY Bight projects, but would be of greater intensity or extent because more projects would be constructed and decommissioned. Impacts would be greater due to the higher level of activity and onshore development for six NY Bight projects. The impacts from some IPFs may increase directly proportionally to the amount of construction; for example, seabed disturbance associated with cable emplacement relates directly to the total miles of cable installed for each of the six NY Bight projects. The impacts from other IPFs may be highly dependent on the specific details of how each of the six NY Bight projects would be constructed; for example, the impacts from port utilization for the six NY Bight projects would be highly dependent on the specific ports proposed to be used, their need for improvements, and whether a specific port may be used to serve multiple projects. In addition, if multiple projects are being constructed at the same time, temporary impacts for certain IPFs, such as those associated with traffic and port utilization, could be greater than those identified for a single project. If projects are staggered over a longer period, the intensity of the impacts could be less than if multiple projects were constructed at the same time, but the overall duration of the impacts could be longer. The impacts and benefits for IPFs may increase, but the magnitude change of specific impacts are not known until COPs are developed for each project. Based on the type, nature, and magnitude of impacts expected under one NY Bight project, although impacts from six NY Bight projects would undoubtedly be larger, the overall impact magnitude is not expected to change.

3.6.3.4.3 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of six NY Bight projects would contribute to the impacts on demographics, employment, and economics from ongoing and planned activities in the geographic analysis area. Construction and conceptual decommissioning of six NY Bight projects that overlap with construction and conceptual decommissioning of other ongoing and planned projects would result in temporary impacts from increased vessel traffic and offshore construction that may disrupt maritime businesses. It is not likely that onshore export cables, onshore substations/converter stations, and other project-specific onshore facilities associated with the six NY

Bight projects would overlap spatially with other projects. However, the six NY Bight projects and other ongoing and planned projects may rely on the same ports and construction staging areas, because it is possible that a given port or staging area capacity has sufficient flexibility to accommodate more than one project's requirements. Cumulative impacts would occur if the six NY Bight projects overlap in the use of ports with other offshore wind projects, leading to greater port congestion and greater economic use and employment opportunities.

The presence of structures from the six NY Bight projects combined with the structures from other ongoing and planned offshore wind projects in the region (Ocean Wind 1 [OCS-A 0498], Ocean Wind 2 [OCS-A 0532], Atlantic Shores South [OCS-A 0499], Atlantic Shores North [OCS-A 0549], and Empire Wind 1 and 2 [OCS-A 0512]) would create permanent space-use conflicts that may have negligible to major adverse impacts on commercial fishing and moderate adverse impacts with minor beneficial impacts on for-hire recreational fishing industries. Commercial fishing GDP for New York ranges from approximately $40 million to $69 million, while for New Jersey ranges from approximately $166 million to $191 million (see Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*). Compared to the ocean sector GDPs of $31 billion for New York and $6.6 billion for New Jersey, although impacts on commercial fishing may be major, such impacts would be negligible to minor on the ocean economies of either state. While the presence of structures would also affect other commercial vessel traffic by requiring most large vessels to navigate around the lease areas, because the lease areas are sited outside of current and proposed vessel traffic lanes (refer to Section 3.6.6, *Navigation and Vessel Traffic*), disruptions to marine transportation and related economic activity would be limited and impacts would be minor. Adverse effects could be counterbalanced by the beneficial effects on the regional economy from increased economic activity and employment associated with the establishment of the New York-New Jersey region as an offshore wind hub, resulting in moderate beneficial impacts on employment and economics. Zhang et al. (2020) estimates that the jobs supported by all development in the New York Bight area are 100 annual development jobs (from 2022 to 2029) and 32,200 annual construction jobs (from 2025 to 2030).

3.6.3.4.4 Conclusions

Impacts of Alternative B. One NY Bight project and six NY Bight projects would likely have **negligible** to **minor** impacts on demographics, employment, and economics. One NY Bight project and six NY Bight projects would affect employment and economics through job creation and increased local business revenue and would likely have **minor beneficial** impacts. The geographic analysis area may experience substantial temporary increased economic activity associated with offshore wind development during the construction and installation phases, a lower and shorter-term increase during conceptual decommissioning, and a low level of increased economic activity over the long-term (35+ years) O&M phase of offshore wind energy production.

While the NY Bight projects' investments in wind energy would largely benefit the local and regional economies through job creation, workforce development, and income and tax revenue, adverse impacts on individual businesses and communities would also occur. Short-term increases in noise during construction, cable emplacement, and conceptual decommissioning; land disturbance; and the long-term presence of offshore lighting and structures would have negligible to minor adverse impacts on demographics, employment, and economics. The commercial fishing industry and other businesses that depend on local seafood production would experience impacts during construction. Overall, the impacts on commercial fishing and onshore seafood businesses would have minor impacts on demographics, employment, and economics for this component of the geographic analysis area's economy. Although commercial fishing is a small component of the regional economy, it is important to the identity of local communities within the region. The IPFs associated with one and six NY Bight projects would also result in impacts on certain recreation and tourism businesses, with an overall minor impact on employment and economic activity for this component of the analysis area's economy.

Cumulative Impacts of Alternative B. In context of reasonably foreseeable environmental trends, the impacts contributed by Alternative B to cumulative impacts on demographics, employment, and economics would be noticeable. BOEM anticipates that cumulative impacts on demographics, employment, and economics from six NY Bight projects when combined with other ongoing and planned activities would likely be **negligible** to **minor** and **moderate beneficial**. The moderate beneficial impacts primarily would be associated with the investment in offshore wind, job creation and workforce development, income and tax revenue, and infrastructure improvements generated from the development of six NY Bight projects plus six ongoing and planned offshore wind projects in the geographic analysis area. The minor adverse effects would result from aviation hazard lighting on WTGs; new cable emplacement and maintenance; the presence of structures; noise and vessel traffic and collisions during construction and conceptual decommissioning; and land disturbance. Impacts on commercial fishing could rise to a major level; however, such impacts would be negligible to minor on the ocean economies of New York and New Jersey because commercial fishing is only one component of the overall ocean economy.

3.6.3.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Demographics, Employment, and Economics

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.6.3.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations.

Although there are no previously applied AMMM measures specific to demographics, employment, and economics, there are many identified for other resources that may indirectly affect demographics, employment, and economics, such as those measures that reduce onshore noise and traffic associated with construction of onshore support facilities or the presence of structure impacts. However, the dynamics of such interactions are complex and not easily quantifiable absent project-specific data. For example, onshore construction can have negative impacts on a local community (e.g., from noise and traffic), but at the same time may use local labor, supplies, or services that positively affect the same community. Thus, the net impact of any AMMM measure on demographics, employment, and economic needs to be assessed when project-specific data are available. Impacts associated with noise, lighting, traffic, and presence of structures would likely be reduced, while impacts for all other IPFs would remain the same as described under Alternative B.

Impacts of One Project

AMMM measures under Sub-alternative C1 that reduce impacts on commercial fisheries and for-hire recreational fishing and recreation and tourism are those most likely to affect employment and economics from a single NY Bight project. As described in Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, and Section 3.6.8, *Recreation and Tourism*, AMMM measures may slightly reduce impacts on commercial fishing, for-hire recreational fishing, and recreation and tourism, which would benefit regional employment and economics, but the impact levels would remain the same as projected for Alternative B—negligible to minor adverse impacts and minor beneficial impacts.

Impacts of Six Projects

Impacts of six NY Bight projects under Sub-alternative C1 would be the same as described for one NY Bight project under Sub-alternative C1. AMMM measures may slightly reduce impacts on commercial fisheries and for-hire recreational fishing and on recreation and tourism, but the impact levels would remain the same as projected for Alternative B—negligible to minor adverse impacts and minor beneficial impacts.

Cumulative Impacts of Sub-alternative C1 (Preferred Alternative)

Under Sub-alternative C1, cumulative impacts on demographics, employment, and economics are anticipated to be the same as described under Alternative B.

3.6.3.5.2 Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any AMMM measures that have not been previously applied for demographics, employment, and economics; therefore, the impacts under Sub-alternative C2 are the same as for Sub-alternative C1.

3.6.3.5.3 Conclusions

Impacts of Alternative C. Impacts on demographics, employment, and economics would be slightly reduced from the AMMM measures that would lessen impacts on other resources like commercial fisheries and for-hire recreational fishing and recreation and tourism. However, under Sub-alternatives C1 and C2, the overall evaluation of impacts would likely remain the same as Alternative B—**negligible** to **minor** impacts and **minor beneficial** impacts from one NY Bight project and six NY Bight projects.

Cumulative Impacts of Alternative C. In context of reasonably foreseeable environmental trends, the impacts contributed by Sub-alternatives C1 and C2 to cumulative impacts on demographics, employment, and economics would be noticeable. The combination of Sub-alternatives C1 and C2 of six NY Bight projects and other ongoing and planned activities would likely result in the same **negligible** to **minor** impacts and **moderate beneficial** impacts on demographics, employment, and economics as Alternative B.

3.6.3.6 Recommended Practices for Consideration at the Project-Specific Stage

BOEM has not identified any RPs for demographics, employment, and economics. However, RPs for other resources that minimize disruptions to businesses—especially those that reduce impacts on commercial fisheries and for-hire recreational fishing and recreation and tourism, while supporting the offshore wind industry—may also benefit demographics, employment, and economics.

3.6 Socioeconomic Conditions and Cultural Resources

3.6.5 Land Use and Coastal Infrastructure

This section discusses potential impacts on land use and coastal infrastructure from the Proposed Action, alternatives, and ongoing and planned activities in the geographic analysis area. The land use and coastal infrastructure geographic analysis area, as shown on Figure 3.6.5-1, includes the counties where onshore infrastructure may be located, the counties with representative ports that may be used by the NY Bight projects, as well as the counties closest to the NY Bight lease areas that may be affected by construction and installation, O&M, and conceptual decommissioning of the NY Bight projects.

The land use and coastal infrastructure impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Because the locations of onshore components for the NY Bight projects are not known at this time, the analysis of land use impacts is dependent on a hypothetical project analysis and impact conclusions consider a maximum-case scenario for onshore development. Additional detailed site-specific analysis will be required for individual COPs. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

3.6.5.1 Description of the Affected Environment and Future Baseline Conditions

The geographic analysis area includes a diverse mix of land use types. In New Jersey, land uses in the geographic analysis area include agricultural, barren, urban, riparian lands, forest, and waterbodies (NJDEP 2015). In New York, land uses include agricultural, commercial, industrial, urban, and recreational lands (Long Island Index 2020; NYC Planning 2021). Figure 3.6.5-2 illustrates the diversity of land uses across the geographic analysis area, and Table 3.6.5-1 provides the acreage of each land use type.

New Jersey and New York both have statewide land use laws and regulations in place that regulate land uses and development, particularly along the coast. The Waterfront Development Law authorizes the NJDEP to regulate the construction or alteration of dock, wharf, pier, bulkhead, bridge, pipeline, cable, or other similar development on or adjacent to tidal waterways throughout the state (NJDEP 2022). The Coastal Area Facility Review Act (CAFRA) authorizes NJDEP to regulate residential, commercial, public, or industrial development (such as construction, relocation, and enlargement of buildings and structures; and associated work such as excavation, grading, site preparation, and the installation of shore protection structures) within the CAFRA area, which includes coastal New Jersey along the Delaware Bay (NJDEP 2022).

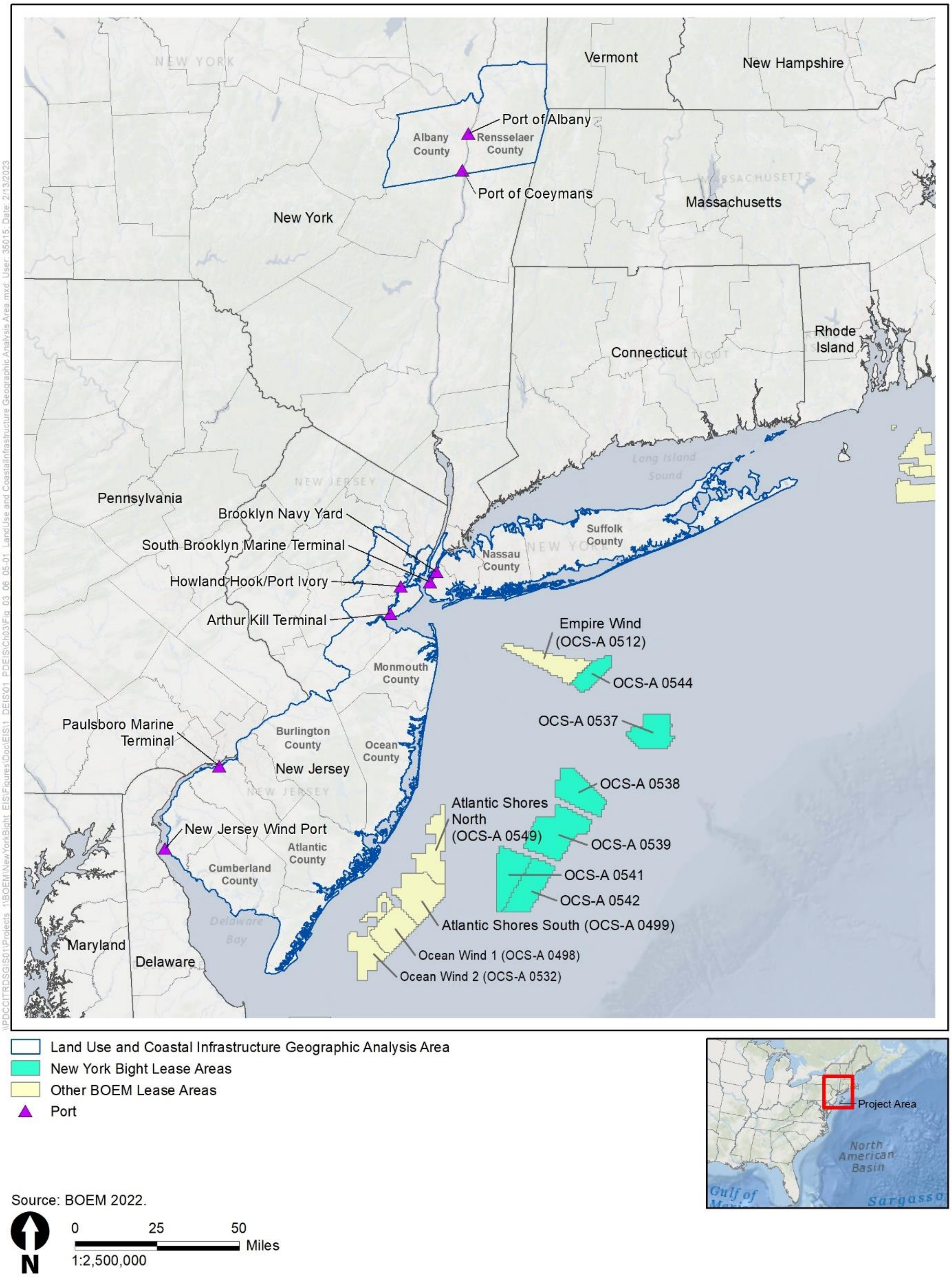


Figure 3.6.5-1. Land use and coastal infrastructure geographic analysis area

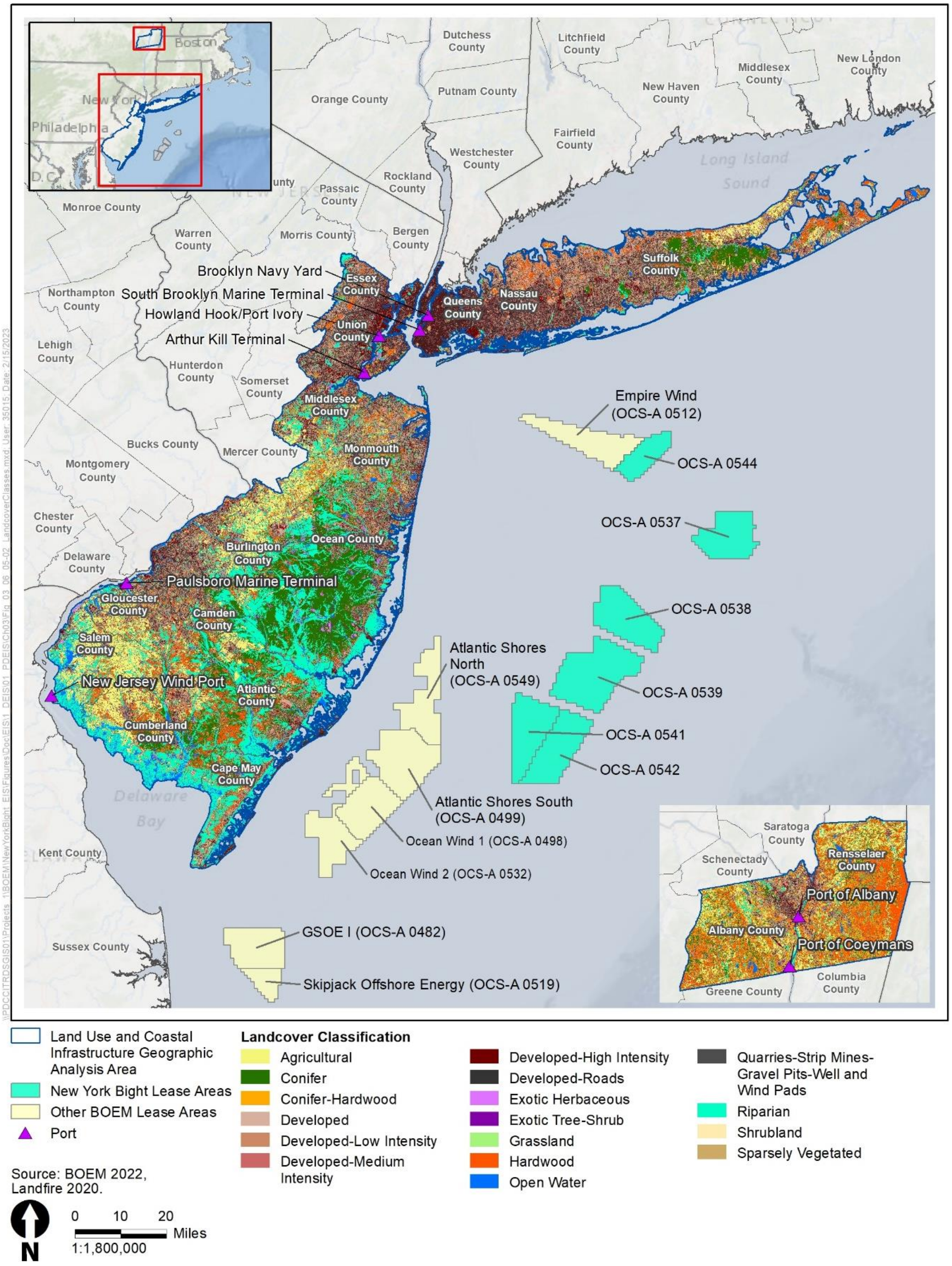


Figure 3.6.5-2. Land uses in geographic analysis area

Table 3.6.5-1. Land use by type

Type of Land Use	Acres	Percent (%)
Agricultural	365,529	9.2%
Conifer	468,544	11.7%
Conifer-Hardwood	70,312	1.8%
Developed	438,403	11.0%
Developed – High Intensity	143,220	3.6%
Developed – Low Intensity	296,394	7.4%
Developed – Medium Intensity	217,279	5.4%
Developed-Roads	652,543	16.4%
Exotic Herbaceous	48,389	1.2%
Exotic Tree-Shrub	8,046	0.2%
Grassland	11,528	0.3%
Hardwood	343,746	8.6%
Open Water	147,372	3.7%
Quarries – Strip Mines – Gravel Pits – Well and Wind Pads	5,908	0.1%
Riparian	758,105	19.0%
Shrubland	1,883	0.0%
Sparsely Vegetated	11,977	0.3%
Total	**3,989,178**	**100.0%**

Source: Landfire 2020.

New York has a Coastal Management Program, which provides a framework for federal, state, and local decision-making that affects coastal land and water areas and uses for actions occurring within the state's coastal boundary. The Coastal Management Program also includes Local Waterfront Revitalization Programs, which allows communities to develop state and federally approved refinements to the state coastal policies to ensure actions are consistent with local planning efforts and special management areas. Related to the federal Coastal Zone Management Act Consistency Review, New York has adopted an approved Renewable Energy Geographic Location Description, which will help make offshore wind project reviews more effective by establishing criteria for automatic review for certain offshore wind projects in the Atlantic Ocean (NYSDOS 2022).

Individual counties and municipalities in New Jersey and New York have individual land use plans and zoning regulations that dictate and govern land uses in the geographic analysis area. Land use is typically regulated through zoning, which is the process local governments use to regulate the use of real property and guide urban growth and development.

Representative ports analyzed in this PEIS that may potentially be used by the NY Bight projects are the New Jersey Wind Port and Paulsboro Marine Terminal in New Jersey and the Port of Albany, Port of Coeymans, Howland Hook/Port Ivory, Arthur Kill Terminal, Brooklyn Navy Yard, and South Brooklyn Marine Terminal in New York. The New Jersey Wind Port is currently being developed as an offshore wind marshalling and assembly port; land use is industrial and undeveloped (NJEDA 2020). The Port of Paulsboro is surrounded by land zoned as marina industrial business (Borough of Paulsboro 2010).

In New York, land use surrounding the Port of Albany is characterized by high-intensity developed land along the Hudson River (NYSERDA 2019a). Land use surrounding the Port of Coeymans is characterized by high-intensity developed land as well as undeveloped land (NYSERDA 2019b). The land use surrounding the Howland Hook/Port of Ivory is primarily industrial (NYSERDA 2019d). The Arthur Kill Terminal, an undeveloped 32-acre parcel on the western shoreline of Staten Island, New York, received federal grants in 2022 to be redeveloped for offshore wind staging and assembly (Empire State Development 2022). The Brooklyn Navy Yard is zoned for industrial uses and is surrounded by commercial, industrial, residential, and open and recreational space (NYSERDA 2022). The land use surrounding the South Brooklyn Marine Terminal is mostly undeveloped (NYSERDA 2019c).

3.6.5.2 Impact Level Definitions for Land Use and Coastal Infrastructure

Definitions of adverse impact levels are provided in Table 3.6.5-2. Beneficial impacts on land use and coastal infrastructure are described using the definitions described in Section 3.3.2, *Impact Terminology,* (Table 3.3-1).

Table 3.6.5-2. Adverse impact level definitions for land use and coastal infrastructure

Impact Level	Definition
Negligible	There would be no measurable impacts on land use, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Impacts would be detectable but would be short term and localized.
Moderate	Impacts would be detectable and broad-based, affecting a variety of land uses, but would be short term and would not result in long-term change.
Major	Impacts would be detectable, long term, and extensive, and result in permanent land use change.

Accidental releases, lighting, port utilization, presence of structures, land disturbance, and traffic are contributing IPFs to impacts on land use and coastal infrastructure. However, these IPFs may not necessarily contribute to each individual issue outlined in Table 3.6.5-3.

Table 3.6.5-3. Issues and indicators to assess impacts on land use and coastal infrastructure

Issue	Impact Indicator
Public health and safety	Construction- or operation-related volume increases, traffic delays, traffic re-routes, and noise
Port improvements and operations	Changes to vehicle, vessel traffic volumes, and working waterfront infrastructure demands
Land use code and zoning	Qualitative assessment of impacts on compliance with local land use regulations

3.6.5.3 Impacts of Alternative A – No Action – Land Use and Coastal Infrastructure

When analyzing the impacts of the No Action Alternative on land use and coastal infrastructure, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for land use and coastal infrastructure. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore and offshore wind activities, which are described in Appendix D, *Planned Activities Scenario*.

3.6.5.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for land use and coastal infrastructure described in Section 3.6.5.1, *Description of the Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore-wind and offshore wind activities. Ongoing non-offshore-wind activities include onshore development activities. The geographic analysis area lies within developed communities that are likely to continue experiencing commerce and development activity in accordance with established land use patterns and zoning regulations. The geographic analysis area is highly developed, and most construction projects would likely affect land that has already been disturbed from past development, although some development of undeveloped land may also occur. The geographic analysis area is a coastal area that may experience long lasting impacts from climate change such as sea level rise, more frequent and intense storms, and flooding (USEPA 2023). The impact of climate change may require storm hardening and resilience measures to overcome impacts on land use and coastal infrastructure.

Ongoing offshore wind activities that may contribute to impacts on land use and coastal infrastructure include construction of Ocean Wind 1 (OCS-A 0498), South Fork Wind (OCS-A 0517), Sunrise Wind (OCS-A 0487), and Empire Wind 1 and 2 (OCS-A 0512). These projects have landfalls in the geographic analysis area. Ongoing offshore wind activities would have the same types of impacts that are described in detail in Section 3.6.5.3.2, *Cumulative Impacts of the No Action Alternative,* for ongoing and planned offshore wind activities.

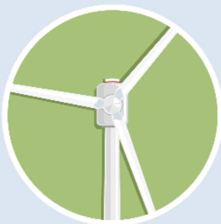
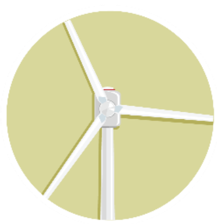
3.6.5.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects). Planned non-offshore-wind activity that may contribute to land use impacts includes port improvement, dredging projects, transmission systems (e.g., PBI), and onshore development activities; more information regarding these projects can be found in Appendix D, Section D.2.5 and Section D.2.12. Ports in the geographic analysis area would continue to serve marine traffic and industries and experience periodic dredging and improvement projects to meet ongoing needs. Dredging and port improvements would allow larger vessels to use the ports and may result in increased port use and conversion of surrounding land use if the ports are expanded. Planned onshore development, such as commercial/industrial development, would contribute to ongoing construction activities and development in the region. Planned onshore infrastructure would be developed in conformance with existing land use regulations.

Ongoing and planned offshore wind activities that may contribute to impacts on land use and coastal infrastructure in the geographic analysis area are listed in Table 3.6.5-4. The location of known onshore infrastructure from ongoing and planned offshore wind projects in the geographic analysis area includes Long Island, New York, for Empire Wind (OCS-A 0512); Monmouth, New Jersey, and Atlantic City, New

Jersey, for Atlantic Shores South (OCS-A 0499); Upper Township, New Jersey, and Lacey Township, New Jersey, for Ocean Wind 1 (OCS-A 0498); East Hampton, New York for South Fork Wind (OCS-A 0517); and Brookhaven, New York for Sunrise Wind (OCS-A 0487). The locations of onshore infrastructure for other offshore wind projects in the geographic analysis area are not known at this time.

Table 3.6.5-4. Ongoing and planned offshore wind that may contribute to impacts on land use and coastal infrastructure

Ongoing/Planned	Projects by Region
Ongoing – 5 projects[1] 	**MA/RI** • South Fork Wind (OCS-A 0517) • Sunrise Wind (OCS-A 0487) **NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 3 projects[2] 	**NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499)

NJ = New Jersey; NY = New York
[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.
[2] Status as of September 20, 2024.

Accidental releases: Accidental releases of fuel, fluids, or hazardous materials may increase due to construction of onshore components associated with other offshore wind projects, such as landfalls and onshore export cable routes. Accidental release risks would be highest during construction, but still pose a risk during O&M and decommissioning of offshore wind facilities. BOEM assumes all projects and activities would comply with laws and regulations to minimize releases. Accidental releases could result in temporary restrictions on use of adjacent properties and coastal infrastructure during the cleanup process; however, the impacts would be localized and short term. The exact extent of impacts would depend on the locations of landfall, substations, and cable routes, as well as the ports that support offshore wind energy projects. The impacts of accidental releases on land use and coastal infrastructure would be minor (except in the case of very large spills that affect a large land or coastal area).

Lighting: Aviation obstruction lights on offshore WTGs would be visible from beaches and coastlines within the geographic analysis area. Nighttime lighting for construction and decommissioning of onshore project components could disrupt existing uses on adjacent properties. These impacts would be localized and short term. Nighttime lighting from operation of onshore substations, O&M facilities, and port facilities could disrupt existing or planned uses on adjacent properties in the long term, depending on the specific location of these facilities, the land use and zoning of adjacent properties, and the extent of visual screening incorporated into the design of offshore wind facilities. Given the existing level of development in the geographic analysis area and that facilities would be sited consistent with local zoning regulations, BOEM anticipates the impact of facility lighting would be negligible.

Port utilization: Ports in the geographic analysis area would be improved to support offshore wind projects and other uses (see Appendix D). These improvements would occur within the boundaries of existing port facilities, within areas planned for expansion, or within repurposed industrial facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. BOEM expects that ports would experience long-term beneficial impacts from greater economic activity and increased employment due to demand for vessel maintenance services and related supplies, vessel berthing, loading and unloading, warehousing and fabrication facilities for offshore wind components, and other business activity related to offshore wind. For example, the Port of Albany estimates that development of a new offshore wind tower manufacturing facility would create approximately 500 construction jobs, 355 direct and full-time new manufacturing jobs, and $350 million in new private investment (Port of Albany 2021). Federal, state, and local agencies would be responsible for minimizing the potential adverse impacts of these future port expansions through zoning regulations and permitting planned improvements and in-water work.

If multiple offshore wind energy projects are constructed at the same time and rely on the same ports, this use could stress port resources and could potentially temporarily increase the marine and road traffic, noise, and air pollution in the area during construction activities. Overall, offshore wind projects would have constant, long-term, minor beneficial impacts on port utilization due to the productive use of ports designated for offshore wind activity, as well as localized, short-term, minor impacts in cases where individual ports are stressed due to project activity.

Presence of structures: Planned and ongoing offshore wind projects would add onshore substations, O&M facilities, and overhead or underground transmission connections to the regional power grid. Improvements to coastal infrastructure such as bulkheads or marinas could also be made to support offshore wind activities. BOEM expects that onshore export cables would generally be buried and would not introduce aboveground structures to the geographic analysis area for land use and coastal infrastructure. Onshore substations, O&M facilities, and overhead electric power transmission lines would be sited consistent with local zoning regulations and ordinances or would be required to obtain a zoning change or other relief.

Non-offshore-wind activities, including transmission systems, could have an impact on existing land use and coastal infrastructure. The Sea Girt NGTC and the adjacent area in Manasquan, New Jersey is one of three major landfall locations in the state of New Jersey for transatlantic and subsea fiber optic and telecommunications cables. The sand replenishment of the beach at the Sea Girt NGTC is a federal civil works project. Construction methods such as HDD may be used to avoid or minimize conflicts between existing and planned coastal infrastructure.

Given the existing level of development in the geographic analysis area and that facilities would be sited consistent with local zoning regulations, BOEM anticipates the addition of onshore infrastructure for offshore wind would have negligible impacts on land use. Improvements made to coastal infrastructure such as bulkheads or marinas to support offshore wind activities would have beneficial impacts on land use and coastal infrastructure.

As described in Section 3.6.9, *Scenic and Visual Resources*, visibility of offshore WTGs would vary with distance from shore, topography, and atmospheric conditions. The presence of WTGs would have negligible impacts on land use because, while WTGs could be visible from some shoreline locations in the geographic analysis area, the presence of WTGs would not be expected to change existing land use patterns.

Land disturbance: Construction and installation of onshore substations, O&M facilities, landfalls, buried onshore export cables, and overhead or underground transmission connections to the regional power grid for offshore wind projects would cause land disturbance and associated impacts (e.g., noise) in the geographic analysis area. Land disturbance for installation of landfalls and buried export cables would be temporary, with areas restored to preexisting conditions following construction. BOEM expects that disturbed areas not occupied by new facilities would be revegetated or otherwise stabilized for erosion control in compliance with stormwater permits for general construction. While the impacts from each individual ongoing and planned offshore wind project would be localized, the combined land disturbance from onshore facilities associated with all ongoing and planned offshore wind projects would affect a variety of land uses across the geographic analysis area, resulting in the potential for moderate impacts.

EMF: Onshore export cables in the geographic analysis area would generate EMF during operation of wind farms. Residents and visitors may be exposed to EMF where cables are installed near businesses, residences, or in public areas. Common household items—including television sets, hair dryers, and electric drills—can emit magnetic fields similar to or higher in intensity than those emitted by power cables (CSA Ocean Sciences, Inc. and Exponent 2019). Based on typical EMF values from submarine cables buried at a depth of 3 feet (1 meter), maximum emissions directly above the onshore export cable would not exceed 165 milliGauss. From 10 to 25 feet (3 to 7.5 meters) away from the onshore export cable, emissions values drop to less than 0.1 to 12 milligauss (Ocean Wind 2023). These values are well below the reported human health reference levels of 2,000 milliGauss for the general population (International Commission on Non-ionizing Radiation Protection 2010). Even if other offshore wind export cables were of higher voltage or buried closer to the surface, EMF levels are still anticipated to be well below the human health reference levels; therefore, EMF impacts on land use would be long-term but negligible.

Traffic: Offshore wind projects could result in increased road traffic and congestion that may affect land use and coastal infrastructure because traffic volumes may dictate where residents and businesses choose to locate. Onshore construction of cables for offshore wind projects would likely disrupt road traffic for a short period of time. The exact extent of impacts would depend on the locations of landfall and onshore transmission cable routes for offshore wind energy projects and traffic management plans developed with local governments. Traffic impacts on land use and coastal infrastructure are anticipated to be negligible.

3.6.5.3.3 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, land use and coastal infrastructure would continue to be affected by existing environmental trends and ongoing activities, as well as climate change. BOEM expects ongoing activities under the No Action Alternative to have continuing temporary and permanent **minor** impacts on land use and coastal infrastructure.

Cumulative Impacts of the No Action Alternative. BOEM anticipates that the cumulative impacts associated with the No Action Alternative, when combined with all other planned activities (including offshore wind) in the geographic analysis area, would likely be **moderate** and **minor beneficial**. Offshore wind projects would adversely affect land use through land disturbance (during installation of onshore cable and substations), accidental releases during onshore construction, and traffic (depending on landfall locations, onshore routes, and time of year), as well as through the presence of offshore lighting on wind energy structures and views of the structures themselves that could affect the use and value of onshore properties. Beneficial impacts on land use and coastal infrastructure would result from the productive use of ports and related infrastructure designed or appropriate for offshore wind activity.

3.6.5.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Land Use and Coastal Infrastructure

3.6.5.4.1 Impacts of One Project

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.

Accidental releases: Accidental releases of fuel, fluids, or hazardous materials could occur during construction and installation, O&M, and conceptual decommissioning of one NY Bight project. The representative NY Bight project's SPCC and OSRP would provide for rapid spill response, cleanup, and other measures to minimize any potential impacts from spills and accidental releases. SPCC is required under the Clean Water Act of 1974 and 40 CFR part 112. OSRP is required under the Oil Pollution Act of 1990 and Executive Order 12777. Should accidental releases occur, there could be temporary restrictions placed on the use of affected properties during the cleanup process. Accordingly, BOEM anticipates that accidental releases from one NY Bight project would have localized, short-term, minor impacts on land use.

Lighting: The types of impacts from lighting from one NY Bight project would be the same as described for the No Action Alternative. The construction and O&M lighting from one individual project is not expected to have a substantial impact on land use and coastal infrastructure. Given the existing level of development in the geographic analysis area and that facilities would be sited consistent with local zoning regulations, BOEM anticipates the impact of facility lighting from one NY Bight project would be negligible.

Port utilization: The Brooklyn Navy Yard, South Brooklyn Marine Terminal, Howland Hook Port Ivory, Arthur Kill Terminal, Paulsboro Marine Terminal, New Jersey Wind Port, Port of Albany, and Port of Coeymans have been identified as representative ports that may be used by the NY Bight projects. While one NY Bight project is not anticipated to require port upgrades, some ports have planned improvements to accommodate offshore wind activities across the region, which are described in Appendix D.

Similar to the No Action Alternative, use of ports by one NY Bight project would result in minor beneficial impacts through greater economic activity and increased employment opportunities. The increase in vessel activity during the construction and installation stage for one NY Bight project would be small and would decrease during operations and decommissioning stages. Therefore, construction and installation, O&M, and conceptual decommissioning would have negligible impacts from port utilization on land use and coastal infrastructure.

Presence of structures: BOEM expects that onshore export cables would generally be buried and would not introduce aboveground structures to the geographic analysis area for land use and coastal infrastructure. Onshore substations, O&M facilities, and overhead electric power transmission lines would be sited consistent with local zoning regulations and ordinances or would be required to obtain a zoning change or other relief. Depending on where the facilities are sited, new aboveground infrastructure could result in the long-term conversion of land from existing conditions to a new use for electric power generation and transmission. Due to the scarcity of waterfront properties in the geographic analysis area, especially in the New York City and Long Island region, electrical facilities that are constructed shoreside could be sited on parcels currently within the public trust (e.g., shorelines, parks), which could pose conflicts with public land uses, such as recreation and coastal resilience projects. Based on BOEM's experience with other offshore wind projects in the region, larger electrical facilities (e.g., substations, O&M facilities) are typically sited on previously disturbed areas and industrial locations, and therefore would not result in long-term changes in land use. Given the existing level of development in the geographic analysis area and that facilities would be sited consistent with local zoning regulations, BOEM anticipates the addition of onshore infrastructure for one NY Bight project would have minor, localized impacts on land use. The presence of one individual project's WTGs would have the same impact as under the No Action Alternative and would likely be negligible.

Land disturbance: Onshore components associated with one NY Bight project are anticipated to include a specific transmission POI in New York or New Jersey and an interconnection point to a regional offshore grid substation. Proper erosion and sedimentation controls would be maintained to avoid and minimize unstable soils that could potentially be moved by wind and runoff. HDD is expected to be used at landfall sites to minimize land disturbance near the shoreline. Land disturbance from onshore construction would produce noise that could affect nearby residential or commercial areas, depending on the location of the facilities, but all noise emissions would be required to comply with local or state noise requirements. Given that the geographic analysis area is highly developed, it is unlikely that one NY Bight project would result in substantial development in previously undisturbed areas. As such, impacts on land use and coastal infrastructure from land disturbance of one NY Bight project would be minor.

EMF: The types of impacts from EMF from one NY Bight project would be the same as described for the No Action Alternative. Onshore export cables in the geographic analysis area would generate EMF during operation of one NY Bight project, but EMF values are anticipated to be well below the reported human health reference levels of 2,000 milliGauss for the general population (International Commission on Non-ionizing Radiation Protection 2010). EMF impacts from onshore cable routes on land use and coastal infrastructure would be long term but negligible.

Traffic: Road traffic associated with one NY Bight project is not anticipated to noticeably add to traffic on the local road system and is therefore anticipated to have the same negligible impact as under the No Action Alternative.

3.6.5.4.2 Impacts of Six Projects

The same IPFs described under one NY Bight project apply to six NY Bight projects. There would be the potential for greater impacts from these IPFs due to the greater amount of onshore development. If multiple projects are being constructed at the same time, temporary impacts associated with land disturbance, traffic, and port utilization could be greater than those identified for one NY Bight project. The development of electric infrastructure for six projects could affect a variety of land uses across the geographic analysis area, reducing the availability of land for other uses. Impacts from six NY Bight projects are anticipated to be moderate, but specific impacts will not be known until COPs are developed for each project, where there will be more detailed project information and analysis.

3.6.5.4.3 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of six NY Bight projects would contribute to the land use impacts from ongoing and planned activities in the geographic analysis area. The greatest cumulative impacts would occur if the landfalls and other electrical infrastructure from six NY Bight projects occur in the same location as other offshore wind projects in the geographic analysis area, including in Long Island, New York, for Empire Wind (OCS-A 0512); Monmouth, New Jersey, and Atlantic City, New Jersey, for Atlantic Shores South (OCS-A 0499); Upper Township, New Jersey, and Lacey Township, New Jersey, for Ocean Wind 1 (OCS-A 0498); East Hampton, New York for South Fork Wind (OCS-A 0517); and Brookhaven, New York for Sunrise Wind (OCS-A 0487). The locations of onshore infrastructure for other offshore wind projects in the geographic analysis area are not known at this time. Cumulative impacts would also occur if six NY Bight projects overlap in the use of ports with other offshore wind projects, leading to greater port congestion but also greater economic use and opportunities. In context of reasonably foreseeable environmental trends, BOEM anticipates that the cumulative impacts associated with six NY Bight projects under Alternative B when combined with past, present, and future activities would be moderate and minor beneficial for land use and coastal infrastructure in the geographic analysis area.

3.6.5.4.4 Conclusions

Impacts of Alternative B. Construction and installation, O&M, and conceptual decommissioning of one NY Bight project under Alternative B would likely have **minor** impacts and **minor beneficial** impacts on land use and coastal infrastructure. Six NY Bight projects would likely have **moderate** impacts because of the increased onshore land disturbance and infrastructure as well as **minor beneficial** impacts from port utilization.

Cumulative Impacts of Alternative B. BOEM anticipates that the impacts associated with Alternative B in the geographic analysis area, combined with ongoing and planned activities, would likely result in **moderate** cumulative impacts and **minor beneficial** cumulative impacts on land use and coastal infrastructure. In context of reasonably foreseeable environmental trends, the impacts contributed by Alternative B to cumulative impacts on land use and coastal infrastructure would likely be noticeable, depending on site-specific project component locations relative to coastal infrastructure locations.

3.6.5.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM measures at the Programmatic Stage – Land Use and Coastal Infrastructure

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives: Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.6.5.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. However, BOEM has not identified any previously applied AMMM measures for land use and coastal infrastructure; therefore, the impacts on land use and coastal infrastructure under Sub-alternative C1 are the same as for Alternative B.

3.6.5.5.2 Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the application of AMMM measures that have not been previously applied. Under this sub-alternative, these AMMM measures (Table 3.6.5-5) are analyzed in addition to the AMMM measures applied under Sub-alternative C1. However, as BOEM has not identified any previously applied AMMM measures for land use and coastal infrastructure in Sub-alternative C1, analysis in Sub-alternative C2 is presented as the change in impacts from those discussed under Alternative B.

Table 3.6.5-5. Summary of not previously applied avoidance, minimization, mitigation, and monitoring measures for land use and coastal infrastructure

Measure ID	Measure Summary
EJ-1a	This measure proposes requiring a lessee to create an Environmental Justice Communications Plan that will guide a lessee throughout the project life on meaningful engagement, and will propose a process for what, how, and to whom the lessee plans to communicate during activities described in the COP that may affect populations with environmental justice concerns, including construction, operations, and decommissioning. The Environmental Justice Communications Plan must be specifically designed for populations with environmental justice concerns and be created in coordination with, at minimum, organizations that serve these populations. Residents of these populations should be involved in the creation of the plan and will have the opportunity to review the plan and provide feedback.

Impacts of One Project

AMMM measure EJ-1a could minimize some impacts on land use and coastal infrastructure specifically relating to the land disturbance and traffic IPFs. Impacts for other IPFs would remain the same as described under Alternative B. EJ-1a would require lessees to develop an Environmental Justice Communications Plan that describes how the lessee intends to communicate with environmental justice communities during activities including construction, operations, and decommissioning. The Environmental Justice Communications Plan would allow communities to prepare for construction activities and minimize impacts on sensitive land uses, such as residences, near the onshore construction sites.

While some impacts on land use may be minimized with EJ-1a, the extent of the impacts cannot be determined without project-specific information. BOEM does not anticipate this measure would substantively reduce the overall impact for one NY Bight project compared to Alternative B, which is minor, or increase the overall beneficial impact, which is minor.

Impacts of Six Projects

For six NY Bight projects, the AMMM measure EJ-1a would implemented be the same as described for one NY Bight project but would cover a larger geographic area and affect more land uses. AMMM measure EJ-1a would minimize impacts on the land disturbance and traffic IPFs by limiting some construction impacts. Residents would be notified of upcoming construction activities, but they would not avoid the development activities that could temporarily and permanently affect land use patterns in the geographic analysis area. Therefore, the overall impact magnitude is not anticipated to change.

Cumulative Impacts of Sub-alternative C2

Under Sub-alternative C2, the same ongoing and planned activities (including offshore wind) as those under Alternative B would contribute to impacts on land use and coastal infrastructure. The construction and installation, O&M, and conceptual decommissioning for six NY Bight projects with the AMMM measure that has not been previously applied would still cumulatively affect land use across the geographic analysis area, although at a slightly reduced level.

3.6.5.5.3 Conclusions

Impacts of Alternative C. The construction, installation, and decommissioning of one NY Bight project under Sub-alternative C1 and Sub-alternative C2 would likely have **minor** impacts and **minor beneficial** impacts on land use and coastal infrastructure. Six NY Bight projects would likely have **moderate** impacts and **minor beneficial** impacts. AMMM measure EJ-1a may slightly reduce overall impacts (but not change the impact level) on land uses under Sub-alternative C2 by minimizing temporary construction impacts in communities with environmental justice concerns.

Cumulative Impacts of Alternative C. BOEM anticipates that the cumulative impacts on land use and coastal infrastructure under Sub-alternatives C1 and C2 in the geographic analysis area from six NY Bight projects combined with ongoing and planned activities would likely be **moderate** and **minor beneficial**. AMMM measure EJ-1a would reduce overall impacts under Sub-alternative C2, but it would not change the impact level. In context of reasonably foreseeable environmental trends, the impacts contributed by Sub-alternatives C1 and C2 to cumulative impacts on land use and coastal infrastructure would be noticeable.

3.6.5.6 Recommended Practices for Consideration at the Project-Specific Stage

In addition to the AMMM measure identified under Sub-alternative C2, BOEM is recommending lessees consider analyzing the RPs in Table 3.6.5-6 to further reduce potential land use and coastal infrastructure impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.6.5-6. Recommended Practices for land use and coastal infrastructure impacts and related benefits

Recommended Practice	Potential Benefit
MUL-5: For onshore and offshore project activities and across all phases of construction and operations, use equipment, technology, and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment.	Using equipment or technology to reduce noise may help prevent noise impacts on certain land uses that may be sensitive to noise, such as residential land use.
REC-1: Prioritize scheduling of nearshore construction activities for outside the summer tourist season, which is generally between Memorial Day and Labor Day.	Scheduling nearshore construction activities outside of the summer tourist season may reduce traffic and noise impacts that would otherwise contribute to the additional tourist traffic and noise.

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3.6 Socioeconomic Conditions and Cultural Resources

3.6.8 Recreation and Tourism

This section discusses potential impacts on recreation and tourism resources and activities from the Proposed Action, alternatives, and ongoing and planned activities in the geographic analysis area. The geographic analysis area, as shown on Figure 3.6.8-1, includes a 47.4-mile (76.2-kilometer) buffer around the NY Bight lease areas in the open ocean (corresponding to the maximum potential visibility of the turbine tips), the ocean-facing coastal counties from which the NY Bight projects would be visible, and counties that may be affected by onshore construction activity. Section 3.6.3, *Demographics, Employment, and Economics*, discusses the economic aspects of recreation and tourism in the geographic analysis area.

The recreation and tourism impact analysis in this PEIS is intended to be incorporated by reference into the project-specific environmental analyses for individual COPs expected for each of the NY Bight lease areas. Refer to Appendix C, *Tiering Guidance*, which identifies additional analyses anticipated to be required for the project-specific environmental analysis of individual COPs.

3.6.8.1 Description of the Affected Environment and Future Baseline Conditions

Recreation and tourism play a major role in New York and New Jersey’s environment and economy. Visitors from all over the world travel to the area to partake in a variety of onshore and marine recreational activities. Marine recreational activities include wildlife viewing tours, scuba diving, and recreational fishing and boating. Popular onshore recreational activities include beach going, surfing, golfing, and scenic viewing. In 2016, the economic value of recreation and tourism for New York State in Nassau and Suffolk County accounted for $2.7 billion (gross domestic product [GDP]), and $1.3 billion in wages; while New Jersey’s Ocean County alone resulted in $569 million (GDP), and $288 million in wages within the state (Center for Blue Economy 2016).

3.6.8.1.1 Project Area and Regional Setting

Coastal areas of New York and New Jersey support ocean-based and onshore recreation and tourism activities, such as recreational and for-hire boating and fishing, guided tours, day use of parks and beaches, outdoor sports, and scenic or wildlife viewing. A 2012 BOEM study identified that the counties within the geographic analysis area are susceptible to impacts on their recreation and tourism economies from offshore wind development (BOEM 2012).

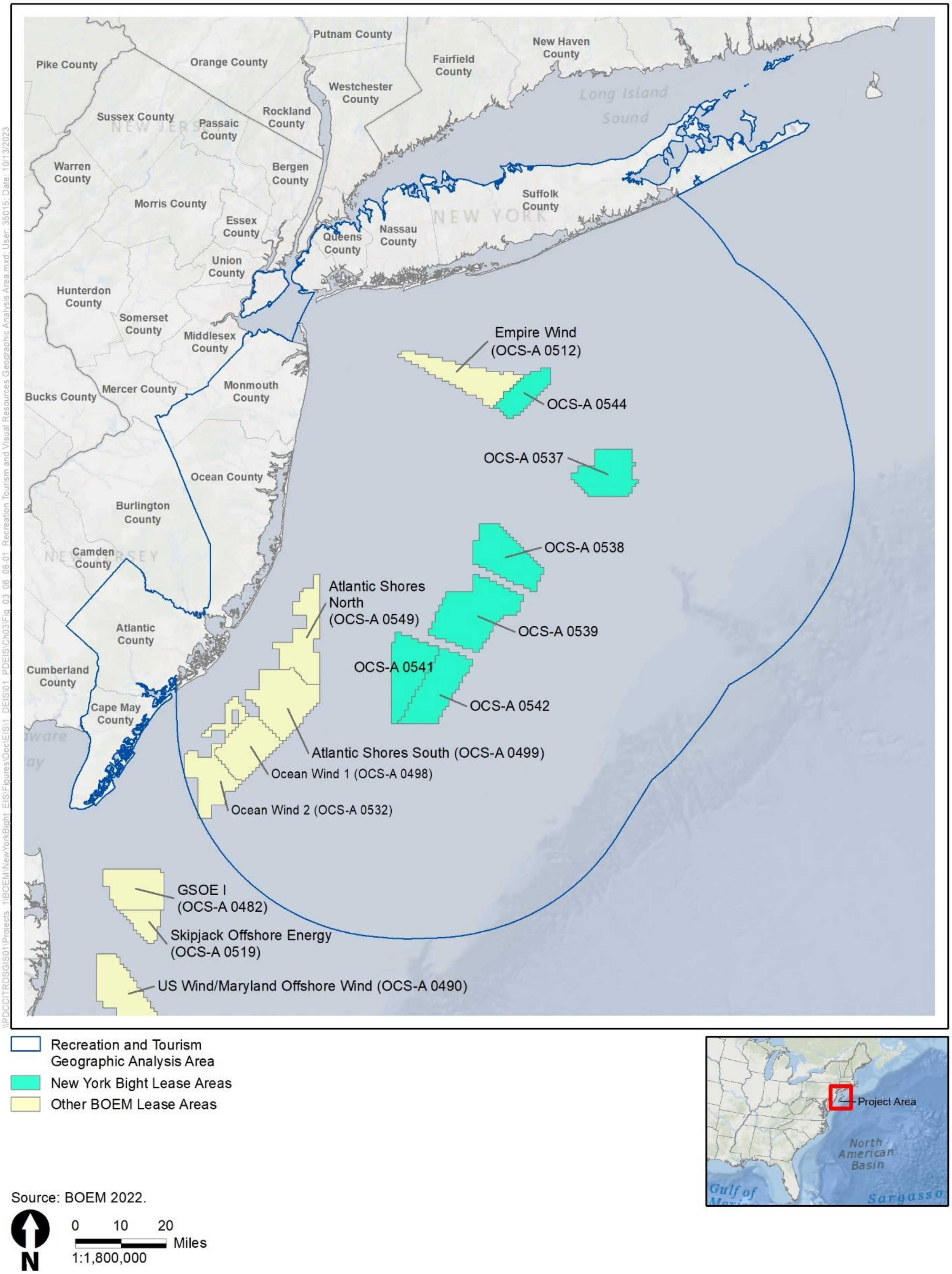


Figure 3.6.8-1. Recreation and tourism geographic analysis area

There are many recreation areas within the geographic analysis area. Though many recreation and tourism opportunities exist in inland portions of coastal counties in New Jersey and New York, this PEIS focuses on areas along the shoreline that have shown a greater dependency on coastal resources. The coastal areas support ocean-based and onshore activities, entertainment, and accommodation, as well as food services related to recreation and tourism. Given the proximity to the Atlantic Ocean, the geographic analysis area has a wide range of characteristics, with communities and landscapes ranging from large cities to small towns, suburbs, rural areas, and wildlife preserves. These coastal areas and shore communities have been extensively developed for water-based recreation and tourism.

The scenic quality of the coastal environment is important to the identity, attraction, and economic health of many coastal communities. Additionally, the recreational and entertainment aspect of outdoor activity on these beaches, within parks, and new and historic coastal towns are important community characteristics. The coastal and ocean amenities, such as beaches, birdwatching, connected trails, and onshore and offshore recreational fishing, are accessible to residents and tourists (whether free or for fee) and function as key drivers for recreation and tourism businesses. Recreational by-product businesses include food, security, water safety, housing, and entertainment.

Given the regional importance and unique attributes of recreational fishing compared to the other types of recreation and tourism, the following discussion is separated into two categories: recreation and tourism, and recreational fishing. Refer to Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, for analysis of commercial fisheries and for-hire recreational fishing.

3.6.8.1.2 Recreation and Tourism

Recreation and tourism contribute substantially to the economies of New York and New Jersey's coastal counties. Counties within the geographic analysis area accounted for $29 billion and $4 billion in GDP, respectively, for New York and New Jersey, which represented 89 percent and 56 percent of their entire state's ocean industry economy (NOAA 2022c). In 2019, 265.5 million people visited New York and spent about $73.6 billion, leading to a $117.6 billion total economic impact through tourism (Empire State Development n.d.). Appendix B, *Supplemental Information and Additional Figures and Tables,* Section B.6 describes recreational resources for each county in the geographic analysis area.

There are numerous federal, state, and local recreational areas and recreational trails within the geographic analysis area. Otis Pike Fire Island High Dune Wilderness, a 7-mile stretch of undeveloped barrier island on Fire Island, is the only federally designated wilderness area within the state of New York. Recreation features within the wilderness area include hiking trails, backcountry camping opportunities, fishing, and scenic views and abundant wildlife that attract bird watchers and wildlife viewers. The Gateway National Recreation Area includes three units: the Jamaica Bay Unit (Jamaica Bay and surrounding properties in Brooklyn and Queens including the western end of the Rockaway Peninsula), the Staten Island Unit (Fort Wadsworth, Miller Field, and Great Kills), and the Sandy Hook Unit (the Sandy Hook peninsula). The Gateway National Recreation Area provides visitors green spaces and beaches alongside historic structures and cultural landscapes and provides space for recreation activities such as boating, bicycling, bird watching, archery, camping, fishing, and guided tours.

Recreational trails for biking, birding, dog walking, fishing, inline skating, and walking (with wheelchair accessibility) also exist within the geographic analysis area. Some of these align with beaches, marinas, and national recreational areas, such as the Ocean Parkway Coastal Greenway in New York and the Sandy Hook Multi-Use Pathway in New Jersey.

Beaches are valuable assets for recreation and tourism. Those beaches regarded as undeveloped are important tourist destinations and are often valued for their remoteness (Peregrine Energy Group 2008) and as such may be sensitive to the visual impacts of offshore wind facilities. The National Park Service Atlantic and Gulf Coast Recreation Area Survey reported that in 2007 there were only two undeveloped beaches in the geographic analysis area of New Jersey: Brigantine Inlet North and Absecon Inlet, which are both in Atlantic County (NPS 2007). Of the three New York State Park Beaches (Hoboken, Wildwood, and Jones Beach), only Jones Beach State Park has a direct line of sight to the NY Bight lease areas (NYSERDA 2021). Further, within the last 10 years storms have ravaged areas in and outside of the geographic analysis area, where coastal restoration is ongoing (NY DEC 2022; NJ DEP 2022). Coastal ecosystem and habitat restoration activity, including beach and dune nourishment projects, support recreational opportunities along the New Jersey and New York coastline. In the geographic analysis area, the relatively few remaining undeveloped beaches, combined with a predominantly developed coast, indicates a tolerance or acceptance of coastal development in most coastal communities. Where wetlands plantings are in place to preserve open spaces and improve environmental quality, project-specific NEPA analyses will address potential impacts and ensure compliance with rigorous local controls. Development will likely avoid disturbances in those areas.

Ocean water-oriented recreational activities include boating, jet skiing, beach going, hiking, fishing, shell fishing, and bird and wildlife viewing. New York and New Jersey are identified as within the top five states with the largest contributions to marine-based recreation and tourism employment, and New York is within the top five states contributing to GDP related to marine-based recreation and tourism (NOAA n.d.). Recreation and tourism contribute approximately 90 percent of employment in the ocean sector economy for New York counties in the geographic analysis area and 58 percent in New Jersey counties analyzed (NOAA 2022c) (see Figures 3.6.3-4 and 3.6.3-5 in Section 3.6.3).

Many water-oriented recreational activities in the geographic analysis area include boating. Boating covers a wide range of activities, from the use of ocean-going vessels to small boats used by residents and tourists in sheltered waters, and includes sailing, fishing, shell fishing, kayaking, canoeing, and paddleboarding. Commercial businesses offer rentals of canoes and kayaks, and private charter boats for recreation, fishing, and wildlife viewing. Many of the activities make use of coastal and ocean amenities that are free for public access. Nonetheless, these features function as key drivers for many coastal businesses, particularly those within the recreation and tourism sectors.

Offshore wildlife viewing in charter boats, such as bird and whale watching, is particularly popular off the New York and New Jersey coasts and in the New York Harbor between spring and fall due to migrations. Chartered bird-watching tours occur at New York Harbor during the winter months, while whale watching occurs at New York Harbor and throughout the NY Bight area, especially during the summer months (NYSERDA 2017). Year-round bird watching occurs in areas off the coast of Long Island near Jones Inlet, the waters off Fire Island Inlet, and Moriches Inlet. Another wildlife viewing area stretches over 60 nautical miles from Jones Inlet to Hudson Canyon and is used by charter vessels specifically for pelagic bird watching during the winter (NYSDOS 2022). New York's whale watching operations are concentrated in three general use areas: outside of New York Harbor, south of Long Island, and east of Montauk. Tours are primarily scheduled from spring through fall, typically peaking in June, July, and August, with some New York-based tour companies offering cruises year-round (NYSDOS 2022). The New York State Department of Environmental Conservation has instituted a New York Bight Whale Monitoring Program that extends south from Long Island to the Outer Continental Shelf, within which this tourism activity occurs (NYSDEC n.d.).

Surface-based marine recreational activities popular along the New York coastline, particularly during the summer, include swimming, surfing, kayaking, paddle boarding, windsurfing, and kite boarding. Surfing usually occurs all along Long Island in New York down the Jersey Shore to Cape May (NJ Beaches 2023). Surfing can occur year-round, with the prime season in the fall. Surfers frequent several towns and cities along the coastline, including Ocean City and Atlantic City. Swimming is popular during the summer months along the miles of white sand beaches (New Jersey Department of State 2021a). Underwater recreation happens throughout the year in New York and New Jersey, but it is most popular between May and October. These activities take place from Long Island to Cape May at sites that include shipwrecks, artificial reefs, beach dives, and various inland sites. The sailing season typically runs from May to October in New Jersey (New Jersey Department of State 2021b) and primarily occurs in relatively small areas within the bays and inlets and just along the coastline (NJ DEP 2021; Ocean Wind 2022).

3.6.8.1.3 Recreational Fishing

There is a large and robust recreational fishing industry in New York and New Jersey. Figure 3.6.1-22 in Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing,* depicts popular for-hire recreational fishing areas offshore New York and New Jersey relative to the six NY Bight lease areas. The *Fisheries Economics of the United States Report of 2019* estimates that recreational fishing had a $309 million impact on New York's economy and a $388 million impact on New Jersey's economy in 2019 (NOAA 2022a). In 2019, there were a reported 13.4 million recreational fishing trips in New York and 13.3 million in New Jersey (NOAA 2022a). BOEM estimates approximately 8.6 million recreational fishing trips are made from New York and New Jersey into the NY Bight area (BOEM 2018). Popular recreational saltwater species in the waters off the NY Bight area are primarily caught from May to October, with seasonal extensions from April to November. Annually, national and regional saltwater fishing tournaments in New York and New Jersey target a variety of fish including stripers, fluke, bluefish, black drum, weakfish, northern kingfish, sea bass, tautog, tuna, and shark (NJDEP 2018a). According to NOAA Fisheries One Stop Shop database, recreational anglers off the coast of New York and New Jersey caught 33,322,544 and 21,344,901 pounds of fish, respectively, in 2019 (NOAA n.d.).

NMFS provides statewide annual marine fishing trip (effort) data for New York for 2022. The shore fishing mode accounted for 1,487,534 trips, the party boat mode for 117,214 trips, the charter boat mode for 73,782 trips, and the private/rental boat mode for 1,647,971 trips, for a total of 3,326,501 recreational fishing trips (NMFS 2023). For New Jersey's annual marine fishing trips for 2022, shore fishing mode accounted for 4,265,032 trips, the party boat mode for 101,309 trips, the charter boat mode for 105,540 trips, and the private/rental boat mode for 2,122,013 trips, for a total of 6,593,894 recreational fishing trips (NMFS 2023). For comparison, NMFS reports inland recreational fishing trips in New York totaled nearly 13 million (80 percent of total trips) while inland fishing trips in New Jersey totaled less than 8 million (54% of total trips).

NOAA's social indicator mapping identifies the importance or level of dependence of recreational fishing to coastal communities (NOAA 2022b). Several communities in the geographic analysis area have a high recreational fishing reliance, which measures the presence of recreational fishing in relation to the population size of a community, and high recreational fishing engagement, which measures the presence of recreational fishing through fishing activity estimates. The communities with the highest recreational fishing reliance and recreational fishing engagement would be most affected by impacts on recreational fishing from offshore wind development.

Recreational crabbing is also important to the region and occurs primarily along the bays and creeks on the Jersey Shore, especially in the upper portions of Barnegat Bay, Little Egg Harbor, and the Maurice River estuary, which contribute 65 to 86 percent of the total recreational harvest (NJDEP 2018b). The peak crabbing season occurs from mid-June until early October and is especially good in August.

3.6.8.2 Impact Level Definitions for Recreation and Tourism

Definitions of adverse impact levels are provided in Table 3.6.8-1. Beneficial impacts on recreation and tourism are described using the definitions described in Section 3.3.2 (see Table 3.3-1).

Table 3.6.8-1. Adverse impact level definitions for recreation and tourism

Impact Level	Definition
Negligible	There would be no measurable impacts, or impacts would be so small that they would be extremely difficult or impossible to discern or measure.
Minor	Impacts would not disrupt the normal functions of the affected activities and communities.
Moderate	The affected activity or community would have to adjust somewhat to account for disruptions due to the project.
Major	The affected activity or community would experience unavoidable disruptions due to large local or notable regional adverse impacts of offshore wind development.

Anchoring, cable emplacement and maintenance, land disturbance, lighting, noise, presence of structures, and traffic are contributing IPFs to impacts on recreation and tourism. However, the IPFs described may not necessarily contribute to each individual issue outlined in Table 3.6.8-2.

Table 3.6.8-2. Issues and indicators to assess impacts on recreation and tourism

Issue	Impact Indicator
Changes to recreation and tourism access and opportunity	Qualitative assessment of changes to the following: • Vehicle/vessel traffic volume • Viewshed • Navigation hazards • Access restrictions
Changes to recreational fishing	Qualitative assessment of impacts on the following: • Loss or damage to fishing gear • Change in distribution and catch of target species • Loss of recreational fishing access sites • Impacts on recreational fishing businesses and expenditures

3.6.8.3 Impacts of Alternative A – No Action – Recreation and Tourism

When analyzing the impacts of the No Action Alternative on recreation and tourism, BOEM considered the impacts of ongoing activities, including ongoing non-offshore-wind and ongoing offshore wind activities on the baseline conditions for recreation and tourism. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore and offshore wind activities, which are described in Appendix D, *Planned Activities Scenario*.

3.6.8.3.1 Impacts of the No Action Alternative

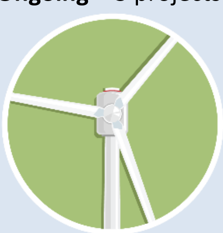
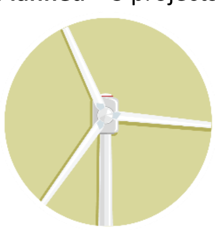
Under the No Action Alternative, baseline conditions for recreation and tourism described in Section 3.6.8.1, *Description of the Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore-wind activities. Ongoing non-offshore-wind activities within the geographic analysis area include ongoing vessel traffic; recreational and commercial fishing; noise and trenching from periodic maintenance or installation of piers, pilings, seawalls, and offshore cables; and onshore development activities. Ongoing activities would contribute to impacts on recreation and tourism through the primary IPFs of anchoring, land disturbance, lighting, cable emplacement and maintenance, noise, presence of structures, and vessel traffic. These activities would contribute to periodic disruptions to recreation and tourism activities but are a typical part of daily life along the New York and New Jersey coastlines and would not substantially affect recreational enjoyment in the geographic analysis area. Visitors would continue to pursue activities that rely on the area's coastal and ocean environment, scenic qualities, natural resources, and establishments that provide services for recreation and tourism. Ongoing offshore wind activities within the geographic analysis area that contribute to impacts on recreation and tourism include ongoing construction of Ocean Wind 1 (OCS-A 0498) and Empire Wind 1 and 2 (OCS-A 0512). Ongoing construction of Ocean Wind 1 and Empire Wind 1 and 2 would have the same type of impacts on recreation and tourism that are described in Section 3.6.8.3.2, *Cumulative Impacts of the No Action Alternative*, for all ongoing and planned offshore wind activities in the geographic analysis area.

3.6.8.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the NY Bight projects). Planned non-offshore-wind activities that would contribute to periodic disruptions to recreation and tourism activities include tidal energy projects, military use, dredge material disposal, and sand borrowing operations; increased vessel congestion that can pose a risk for collisions or allisions; dredging and port improvements, marine transportation, and oil and gas activities; or activities that pose a risk for gear entanglement such as undersea transmission lines, gas pipelines, and other submarine cables. See Appendix D for a description of planned activities. Like ongoing activities, other planned non-offshore-wind activities may result in periodic disruptions to recreation and tourism activities along the coast. However, visitors are expected to be able to continue to pursue activities that rely on other coastal and ocean environments, scenic qualities, natural resources, and establishments that provide services to recreation and tourism.

Ongoing and planned offshore wind projects in the geographic analysis area are listed in Table 3.6.8-3.

Table 3.6.8-3. Ongoing and planned offshore wind projects in the geographic analysis area for recreation and tourism

Ongoing/Planned	Projects by Region
Ongoing – 3 projects[1] 	**NY/NJ** • Ocean Wind 1 (OCS-A 0498) • Empire Wind 1 (OCS-A 0512) • Empire Wind 2 (OCS-A 0512)
Planned – 3 projects[2] 	**NY/NJ** • Ocean Wind 2 (OCS-A 0532) • Atlantic Shores North (OCS-A 0549) • Atlantic Shores South (OCS-A 0499)

NJ = New Jersey; NY = New York
[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.
[2] Status as of September 20, 2024.

BOEM expects ongoing and planned offshore wind activities to affect recreation and tourism through the following IPFs.

Anchoring: Anchoring could potentially affect recreational boating in the geographic analysis area both through the presence of an increased number of anchored vessels during offshore wind construction and installation, O&M, and conceptual decommissioning and through the creation of offshore areas with cable or scour protection where anchors of smaller recreational vessels may fail to hold.

Development of offshore wind projects would increase the number of vessels anchored offshore, particularly in offshore work areas during construction and installation. Vessel anchoring would also occur during O&M but at a reduced frequency. Anchored vessels for offshore wind projects would have localized, intermittent, long-term impacts on recreational boating.

Ongoing and planned offshore wind projects would add scour protection for WTGs and would create offshore areas with cable hardcover, which could create resistance to anchoring for recreational boats. Scour and cable protection would have localized, long-term impacts on anchoring for recreational boats. BOEM expects that recreational boaters could navigate around anchored vessels and adjust their locations to avoid cable and scour protection issues with brief inconveniences; therefore, impacts would likely be minor.

Land disturbance: Ongoing and planned offshore wind development would require installation of landfalls, onshore export cable and interconnection cable, and onshore substations, which could result in localized, temporary disturbance to recreational activity or tourism-based businesses near construction sites. BOEM expects these impacts would be localized and temporary during construction and installation, and O&M and conceptual decommissioning impacts would be reduced. The exact extent of impacts would depend on the specific locations chosen for offshore wind projects; however, the impacts would generally be localized, temporary, and minor.

Lighting: Offshore wind projects would add new sources of light to onshore and offshore areas including from nighttime vessel lighting and fixed lighting at onshore substations. BOEM expects that lighting at onshore substations would have negligible impacts on recreation and tourism as onshore lighting is a prevalent feature along the New York and New Jersey coast. Impacts of vessel lighting would be temporary for the duration that the vessel is engaged in construction and installation, O&M, or conceptual decommissioning activities. WTGs would be lit and marked in accordance with FAA and USCG requirements for aviation and navigation obstruction lighting, respectively. The lighting on WTGs would be visible from beaches and coastlines within the geographic analysis area and could have long-term impacts on recreation and tourism in certain locations if the lighting influences visitor decisions in selecting coastal locations to visit. The implementation of ADLS would activate a hazard lighting system in response to detecting nearby aircraft and, if ADLS is implemented, would result in shorter-duration night sky impacts on the seascape, landscape, and viewers relative to the WTG lighting.

The New York and New Jersey shores within the viewshed of ongoing and planned offshore wind projects have been extensively developed, and existing nighttime lighting is prevalent. Elevated boardwalks, jetties, and seawalls afford greater visibility of offshore elements for viewers in tidal beach areas. Nighttime views toward the ocean from the beach and adjacent inland areas are diminished by ambient light levels and glare of shorefront developments. Visible aviation warning lighting would add a developed/industrial visual element to views that were previously characterized by dark, open ocean, broken only by transient lighted vessels and aircraft passing through the view. As a result, although lighting on WTGs would have a continuous, long-term, adverse impact on recreation and tourism, the impact in the geographic analysis area is likely to be limited to individual decisions by visitors to the New York and New Jersey coastline and elevated areas, with less impact on the recreation and tourism industry as a whole. Lighting impacts on recreation and tourism are anticipated to be negligible due to the distance of the offshore wind development projects from shore and the use of ADLS.

Cable emplacement and maintenance: An estimated 3,094 miles (4,979 kilometers) of submarine export cable and interarray cable would be installed in the geographic analysis area between 2023 and 2030 for ongoing and planned offshore wind projects. Offshore cable emplacement for offshore wind development projects would have temporary, localized, adverse impacts on recreational boating while cables are being installed, because vessels would need to navigate around work areas and recreational boaters would likely prefer to avoid the noise and disruption caused by installation. Cable installation could also have temporary impacts on fish and invertebrates of interest for recreational fishing, due to the required dredging, turbulence, and disturbance; however, species would recover upon completion. The degree of temporal and geographic overlap of each cable is unknown, although cables for some projects could be installed simultaneously. Active work would only occur over the cable segment being emplaced at a given time. Once installed, cables would affect recreational boating only during maintenance operations, except that the mattresses covering cables in hard-bottom areas could hinder anchoring and result in gear entanglement or loss. Impacts of cable emplacement and maintenance on recreational boating and tourism would be short term, continuous, adverse, and localized. Disruptions from cable emplacement and maintenance are anticipated to have a minor impact on recreation and tourism.

Noise: Noise during construction (e.g., from pile-driving) or vehicle/vessel traffic could result in adverse impacts on recreation and tourism. Onshore construction noise near beaches, parkland, recreation areas, or other areas of public interest would temporarily disturb the public's quiet enjoyment. Offshore construction noise could cause boaters to avoid construction areas, although safety zones that USCG may establish for construction areas would be off-limits to boaters. Noise from operational WTGs would be expected to have little effect on finfish, invertebrates, and marine mammals, and consequently little effect on recreational fishing or sightseeing.

Adverse impacts of noise, especially from pile-driving, would also affect recreation and tourism due to impacts on species important to recreational fishing and sightseeing. Using information from the Ocean Wind 1 COP, noise from pile-driving, the noisiest aspect of WTG installation, is estimated to be 101 A-weighted decibels (dBA) at 50 feet (COP Volume III, Appendix R-1, Section 2.5; Ocean Wind 2022). Most recreational fishing takes place closer to shore, so construction of WTGs or OSSs would affect only a small proportion of recreational fishing. Temporary impacts from offshore construction noise will more likely affect recreational fishing for offshore species (e.g., tuna, shark, and marlin). Offshore construction noise also could contribute to temporary impacts on marine mammals, with resulting impacts on chartered tours for whale watching or other wildlife viewing. BOEM qualitatively analyzed impacts on recreational fisheries in the Atlantic OCS region during the offshore construction phase and found slightly negative to neutral impacts on recreational fisheries from both direct exclusion of fishing activities and displacement of mobile target species by construction noise (Tougaard 2008).

BOEM expects that offshore wind construction would result in localized, temporary impacts on recreational fishing and marine sightseeing related to fish and marine mammal populations. If multiple offshore wind construction projects are constructed concurrently, this would increase the spatial extent of temporary disturbances to marine species but would also decrease the temporal extent of these impacts. No long-term, adverse impacts are anticipated, provided that mitigation measures are implemented to prevent population-level harm to fish and marine mammal populations.

Presence of structures: The construction and installation of 697 WTGs within the recreation and tourism geographic analysis area would have long-term, adverse impacts on recreational boating and fishing through the risk of allision; risk of gear entanglement, damage, or loss; navigational hazards; space use conflicts; presence of cable infrastructure; and visual impacts. However, ongoing and planned offshore wind structures could potentially increase the number of trips and revenue by creating new locations for recreational or for-hire fishing through fish and sea turtle attraction and reef effects by creating hard-bottom habitat known to attract numerous species of algae, shellfish, finfish, and sea turtles and result in increased recreational boaters traveling farther from shore.

The presence of offshore wind structures would increase the risk of allision and the complexity of navigation within the geographic analysis area. Generally, smaller vessels moving within and near wind farm installations, such as recreational vessels, are at a greater risk of allisions with WTGs or OSSs. Offshore wind development could require recreational boaters, anglers, sailboat races, and sightseeing boats to adjust their routes. Recreational boating routes in the NY Bight area mainly occur within 3 nautical miles (5.5 kilometers) of the coastline (NY State Parks n.d.). Thus, the impact of these offshore structures would be limited by their farther distances from shore.

As it relates to the visual impacts of structures, the vertical presence of WTGs on the offshore horizon may affect recreational experience and tourism in the geographic analysis area. Section 3.6.9, *Scenic and Visual Resources*, describes the visual impacts from offshore wind infrastructure. A study conducted by Parsons and Firestone (2018) suggests that WTGs visible from more than 15 miles (24.1 kilometers) away would have negligible effects on businesses dependent on recreation and tourism activity. At this distance, the percentage of respondents who indicated that their experience would be improved by the presence of WTGs was the same as the percentage of respondents who indicated that their experience would be worsened by the WTGs. The study found proximity of WTGs to shore is correlated to the number of respondents who would expect a worsened coastal experience (Parsons and Firestone 2018). However, the majority of respondents (68 percent) indicated that the visibility of WTGs would neither improve nor worsen their experience. Respondents were shown a visual simulation for this survey, and it should be noted that the turbines depicted were smaller than those proposed for the NY Bight area. Reported trip loss (respondents who stated that they would visit a different beach without offshore wind) averaged 8 percent when wind projects were 12.5 miles (20 kilometers) offshore and 6 percent when 15 miles (24.1 kilometers) offshore. Within the geographic analysis area, while some WTGs associated with ongoing and planned offshore wind projects would be within 10 miles (16 kilometers) of shore, the majority of WTGs would be more than 15 miles (24.1 kilometers) from coastal locations.

Carr-Harris and Lang (2019) assessed the potential impacts of offshore wind energy development on tourism by examining how the Block Island Wind Farm has impacted the vacation rental market. Using data from Airbnb, they compared three nearby tourist destinations in Southern New England before and after construction. The results suggest that construction of the Block Island Wind Farm caused a significant increase in nightly reservations, occupancy rates, and monthly revenues for Airbnb properties during the peak tourism months of July and August but had no effect in other months. The findings indicate that offshore wind farms can act as an attractive feature of a location, rather than a deterrent.

In a 2020 survey-based study, 11.4 percent of participants indicated that they would tour offshore wind facilities 12.5 miles (20 kilometers) offshore (Parsons et al. 2020), but the number of participants decreases as structures move farther offshore. A majority of respondents who would make the trip expect it to be a one-time trip. Although the likelihood of recreational vessels visiting offshore structures decreases with distance from shore, increasing numbers of offshore structures may create increased recreational vessel traffic to these structures. Additional vessel traffic from these fishing and tourism activities would increase the chance of allisions and collisions among recreational, sightseeing, or commercial vessels.

A 2019 survey of over 500 New Hampshire coastal recreation users found 77 percent support for offshore wind development, 12 percent opposition, and 11 percent neutral. Regarding the impact on their outdoor recreation experience, 43 percent anticipated a beneficial impact, 31 percent anticipated a neutral impact, and 26 percent anticipated an adverse impact (Tourism Economics 2019; BOEM 2021).

Additionally, a 2020 survey-based preference study to determine attitude toward offshore wind and if the presence of offshore wind turbines affects the number of trips a beachgoer makes to the beach found that developed beaches with boardwalks and beaches that were designated as local, state, or national parks had the lowest amount of reported trip cancellation (Parsons et al. 2020). Because many of New Jersey's and New York's most visited beaches are quite developed, long-term impacts on recreation and tourism are not expected. The beachgoers at local, state, or national park beaches self-reported as more favorable toward wind power and correspondingly appeared less inclined to cancel a trip due to the presence of wind turbines.

Based on currently available studies and the distance of ongoing and planned offshore wind projects from shore, BOEM anticipates that the WTGs associated with ongoing and planned offshore wind projects in the geographic analysis area could have a minor adverse impact on recreation and tourism when discernible in previously undeveloped views. The impact of visible WTGs on recreation would be long term and continuous. However, Parsons and Firestone (2018) found that beyond 15 miles (24.1 kilometers) from shore, the percentage of people who responded negatively vs. positively to seeing offshore wind infrastructure was nearly equal. In addition, beneficial impacts due to the presence of offshore structures could provide opportunities for fishing and sightseeing due to a reef effect.

Traffic: Offshore wind project construction and conceptual decommissioning and, to a lesser extent, offshore wind project operation would generate increased vessel traffic that could inconvenience recreational vessel traffic. The impacts would occur primarily during construction, along routes between ports and offshore wind construction areas. Vessel traffic for each project is not known but is anticipated to result in a small increase in current vessel traffic for the NY Bight area. BOEM expects that vessel traffic would have minor impacts on recreation and tourism.

3.6.8.3.3 Conclusions

Impacts of the No Action Alternative. Under the No Action Alternative, recreation and tourism would continue to be affected by existing environmental trends and ongoing activities. The impacts of ongoing activities, including ongoing construction of offshore wind, ongoing vessel traffic, presence of structures, and the noise and trenching from periodic maintenance or installation of piers, pilings, seawalls, or offshore cables, would be **negligible** to **minor**.

Cumulative Impacts of the No Action Alternative. Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and recreation and tourism would continue to be affected by the primary IPFs of anchoring, land disturbance, lighting, cable emplacement and maintenance, noise, presence of structures, and vessel traffic. The impacts of planned non-offshore-wind activities would be similar to the impacts of ongoing, non-offshore-wind activities. Impacts on recreation and tourism from planned offshore wind activities would be long term, localized, and negligible for lighting; long term, localized, and minor from anchoring and from presence of structures; and short term, localized, and minor due to land disturbance, noise, traffic, and cable emplacement and maintenance. Planned offshore wind activities in the analysis area would likely also result in minor beneficial impacts due to the presence of offshore structures, which could provide opportunities for fishing and sightseeing due to a reef effect. Overall, the No Action Alternative combined with all planned activities in the geographic analysis area would likely result in **negligible** to **minor** impacts and **minor beneficial** impacts on recreation and tourism.

3.6.8.4 Impacts of Alternative B – No Identification of AMMM Measures at the Programmatic Stage – Recreation and Tourism

Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring,* that could avoid, minimize, mitigate, and monitor those impacts.

3.6.8.4.1 Impacts of One Project

Anchoring: Construction and installation, O&M, and conceptual decommissioning of a single NY Bight project would increase the number of vessels anchored offshore and would require the addition of scour protection for WTG foundations and cable protections. Anchored vessels for construction and installation, O&M, and conceptual decommissioning of one NY Bight project would have localized, intermittent, temporary impacts on recreational boating. The addition of scour and cable protection would have localized, long-term impacts on anchoring for recreational boats. BOEM expects that recreational boaters could navigate around anchored vessels and adjust the locations for dropping anchor to avoid cable and scour protection with only brief inconvenience. The anticipated impacts from anchoring on recreation, tourism, or recreational fishing in the geographic analysis area for one NY Bight project would be minor.

Land disturbance: One NY Bight project would require one or more cable landfall(s), onshore export cabling, possible substation and converter station construction, and support service facilities, resulting in vehicle traffic, noise, and construction sites that could reduce visitor enjoyment and temporarily restrict access to recreational sites. Impacts associated with construction of onshore elements would be most likely to occur if construction activities take place during the tourism high season (generally May through September) and disrupt access to recreation areas or create disruptive noise. The disruption would likely be localized and temporary so impacts would be minor. While direct disturbance to recreational sites (e.g., beaches, parks) is possible, BOEM anticipates popular recreational areas would likely be avoided and any impacts, if they did occur, would be temporary. Site-specific project information is needed to fully analyze the extent of impacts on recreational sites.

Lighting: One NY Bight project would add new sources of onshore and offshore light, including nighttime vessel lighting, fixed lighting at onshore substation/converter station sites, and at up to 280 WTGs and up to 5 OSSs. As described for the No Action Alternative, lighting at onshore substations/converter stations is anticipated to have a negligible impact on recreation and tourism because onshore lighting is already a prevalent feature along the New York and New Jersey coast.

Because of the distance from shore (the NY Bight lease area nearest to shore is 20 nautical miles [37 kilometers] offshore, lighting on the WTGs and OSS is not anticipated to have a substantial effect on views. However, as described in Section 3.6.9, *Scenic and Visual Resources*, in the absence of an ADLS system, there would be new, constant sources of nighttime lighting in view of the coastline for the NY Bight project. Nighttime lighting could have long-term impacts on recreation and tourism if the lighting influences visitor decisions in selecting coastal locations to visit. The addition of a single project in the NY Bight area would result in long-term, minor impacts on recreation and tourism, primarily as a result of offshore lighting on WTGs and OSS.

Cable emplacement and maintenance: The development of one NY Bight project would result in seafloor disturbance due to the installation of interarray and export cables. Cable emplacement could prevent deployment of fixed and mobile fishing gear in limited parts of the NY Bight area from one day up to several months (if simultaneous lay and burial techniques are not used), which may result in the loss of access if alternative fishing locations are not available. Impacts would be greatest if cables are installed in areas of high recreational fishing activity, as shown on Figure 3.6.1-22. Activities from support vessels, cable emplacement, and routine or emergency maintenance repairs would temporarily impact access to some areas. Overall, cable emplacement and maintenance would not restrict large areas, and navigational impacts on recreational fishing grounds would be on the scale of hours to days. Cable emplacement and maintenance as a result of a single NY Bight project would likely result in localized and temporary minor adverse impacts on recreation and tourism.

Dredging and turbulence during cable installation could also affect fish and marine mammals of interest for recreational fishing and sightseeing, although species would recover upon completion (Section 3.5.7, *Sea Turtles*, and Section 3.5.6, *Marine Mammals*), resulting in localized, short-term, minor impacts on recreation and tourism. Cable emplacement and maintenance that occur near beaches, fishing sites, or nearshore recreational activities could contribute to recreational impacts related to temporary water quality impacts during construction and maintenance. As discussed in Section 3.4.2, *Water Quality*, impacts on water quality from cable installation and maintenance would be short term and minor and are therefore not anticipated to result in substantive impacts on recreation and tourism.

Noise: Noise from operation of construction equipment, pile-driving, HRG surveys, and vehicle or vessel traffic associated with a single NY Bight project could result in adverse impacts on recreation and tourism. Onshore construction noise near beaches, parkland, recreation areas, or other areas of public interest would temporarily disturb the quiet enjoyment of the sites (in locations where such quiet is an expected or typical condition).

Similarly, offshore construction noise would intrude upon the natural sounds of the marine environment, adversely affecting recreational enjoyment of the marine and coastal environments. Using Ocean Wind 1 as representative of pile-driving for a single NY Bight project, noise from pile-driving—the noisiest aspect of WTG installation—is estimated to be 101 dBA at a distance of 50 feet (Ocean Wind 2022). Over water, the piling noise would be barely audible at 7 miles downwind (Ocean Wind 2022). Accordingly, even where areas within or near the offshore export cable route and lease area are available for recreational boating during construction, increased noise from construction would be limited to a small area in the larger NY Bight and would represent only a temporary inconvenience to recreational boaters. The temporary disruptions to or changes in offshore fish, shellfish, and whale populations (see Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, and Section 3.5.6, *Marine Mammals*) as a result of construction noise would have a minor impact on recreational fishing or marine sightseeing. The overall impact from one NY Bight project is expected to be minor.

Presence of structures: The construction and installation of between 50 and 280 WTGs and between 1 and 5 OSSs associated with one NY Bight project within the recreation and tourism geographic analysis area would contribute to impacts on recreational fishing and boating. The offshore structures would have long-term, adverse impacts on recreational boating and fishing through the risk of allision; risk of gear entanglement, damage, or loss; navigational hazards; space use conflicts; presence of cable infrastructure; and visual impacts. However, offshore wind structures could have beneficial impacts on recreation through fish aggregation and reef effects. The impact from one NY Bight project would likely be negligible to minor.

As described in Section 3.6.8.3.2, *Cumulative Impacts of the No Action Alternative*, recreation and tourism may benefit from the presence of operational WTGs. Parsons (Parsons et al. 2020) documented large increases in the number of trips to the shoreline to view offshore wind projects in parts of Europe. New studies of the Block Island Wind Farm corroborate positive effects on tourism. In a study relying on trends in summer vacation property rentals, researchers at the University of Rhode Island observed a 19 percent increase in summer monthly revenue for Block Island vacation property landlords compared to other regional summer vacation rental destinations such as Narragansett and Westerly, Rhode Island, and Nantucket, Massachusetts. The factors that may be driving the increase in rental volume are not defined in the study, but the researchers hypothesized that tourists may be curious to see the wind farm or that the recreational fishing near the wind farm has improved significantly, thereby increasing interest in visiting the wind farm itself (Atlantic Shores 2021; Carr-Harris and Lang 2019). Based on a study prepared by Parsons and Firestone (2018), beaches with views of WTGs could gain trips from the estimated 2.6 percent of beach visitors for whom viewing the WTGs would be a positive result, offsetting some lost trips from visitors who consider views of WTGs to be negative and the 8 percent of respondents who stated they would visit a different beach (without offshore wind development).

Recreational anglers may avoid fishing in the NY Bight lease area due to concerns about their ability to safely fish within or navigate through the area. As noted in Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, navigational hazards and scour/cable protection due to the presence of structures from one NY Bight project would result in substantial adverse impacts on commercial fisheries and for-hire recreational fishing. Similar impacts would also result for recreational anglers who would travel the minimum of 20 nautical miles (37 kilometers) to the nearest NY Bight lease area (or over 35 nautical miles [65 kilometers] to the farthest NY Bight lease area). However, because most recreational anglers fish much closer to shore (Figure 3.6.1-22), BOEM anticipates impacts on recreational fishing from presence of structures would be minor.

As described more fully in Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, the presence of structures and cable protection can create a “reef effect,” providing ecological benefits and habitat diversity. The offshore foundations, scour protection, and cable protection provide habitat for developing new ecosystems and attract species seeking prey or refuge from predators. For example, the creation of structured habitat is expected to benefit species such as striped bass, black sea bass, and Atlantic cod by potentially increasing their habitat. Similarly, the presence of foundations may increase habitat and provide forage and refuge for some migratory finfish targeted by recreational fishermen. Increasing potential habitat for fish and their prey may positively affect recreational fishing within a NY Bight lease area. Additionally, interest in visiting a single NY Bight project lease area may result in an increased number of fishing trips originating from New Jersey and New York ports. These additional vessel trips could support an increase in angler expenditures at shoreside facilities servicing recreational fishermen (Atlantic Shores 2021; Kirkpatrick et al. 2017).

Traffic: A single NY Bight project would generate a small increase in vessel traffic compared to baseline conditions, with a peak during construction and conceptual decommissioning and reduced traffic during O&M. As described in Section 3.6.6, *Navigation and Vessel Traffic*, based on vessel trip estimates from nearby ongoing and planned offshore wind projects (Ocean Wind 1 [OCS-A 0498], Atlantic Shore South [OCS-A 0499], and Empire Wind [OCS-A 0512]), one NY Bight project is anticipated to generate up to 51 vessels at any given time during construction and 8 vessel trips per day during O&M. Construction support vessels, including vessels carrying assembled WTGs or WTG and OSS components, would be present in the waterways between the NY Bight project area and the ports used during construction and installation and during conceptual decommissioning. Recreational vessels may experience delays within the ports serving construction, but most recreational boaters in the geographic analysis area would experience only minor inconvenience from construction-related vessel traffic. Vessel travel requiring a specific route that crosses or approaches the offshore export cable routes could experience minor impacts. Recreational boating and fishing activities would be required to avoid project vessels and restricted safety zones through routine adjustments to navigation. Although tourists may experience increased transit times in some situations, these situations are spatially and temporally limited. O&M activities would only periodically be present in the NY Bight lease areas.

Section 2.3, *Non-Routine Activities and Events*, describes the non-routine activities associated with a NY Bight project. Activities requiring repair of WTGs, equipment, or cables, or spills from maintenance or repair vessels, which could affect water quality, would generally require intense, temporary activity to address emergency conditions or respond to an oil spill. Additionally, accidental releases of chemicals, gases, or man-made debris may occur as a result of a structural failure. Non-routine activities could temporarily prevent or deter recreation or tourist activities near the site of a given non-routine event, but these impacts would be temporary. Overall, BOEM expects vessel activities in the open waters between the project area and ports and along the cable corridor to result in a small increase in current levels of vessel traffic and have only minor impacts on recreation and tourism.

3.6.8.4.2 Impacts of Six Projects

The same impact types and mechanisms described for a single NY Bight project apply to six NY Bight projects for anchoring, land disturbance, cable emplacement and maintenance, noise, presence of structures, and vessel traffic. However, there would be more potential for impacts due to the larger number of projects occurring and the subsequent greater amount of offshore and onshore development. Impacts from anchoring are still expected to remain minor because anchoring is not expected to substantially affect or disrupt recreational fishing. Land disturbance from six NY Bight projects would increase compared to one NY Bight project, but the impact would remain minor as impacts are anticipated to be temporary during construction.

The amount of nighttime lighting that would be visible from WTGs and OSSs would increase with six NY Bight projects without the use of ADLS. However, because of the distance from shore from any of the NY Bight leases (the closest lease area is 20 nautical miles [37 kilometers] offshore) and the pervasive light sources already present along the New York and New Jersey coastline, impacts from lighting would likely remain minor. Noise impacts would increase in duration and geographic extent and therefore would affect more recreational boaters and anglers. However, because most recreational boating activity occurs closer to shore than the NY Bight lease areas, impacts would remain minor. Disruptions to fish and whale populations as a result of construction noise could also increase impacts on recreational fishing or marine sightseeing, but impacts would be temporary and remain minor.

Impacts from cable emplacement and maintenance under six NY Bight projects would range from minor to moderate, an increase from minor impacts under a single NY Bight project. The increased impacts would be due to multiple areas of cable installation potentially occurring simultaneously, increasing the potential for temporary access limitations on recreational fishing vessels. However, the area used by installation vessels would still be small relative to the size of available access to other fishing grounds, and recreational fishing vessels would be able to make temporary adjustments during construction and O&M.

Because of the increased number of WTGs and OSSs across the six NY Bight lease areas, the impact from the presence of structures would increase to moderate. The increased impacts would be due to the larger area where recreational boating and fishing would be at risk of allision, gear entanglement, increased navigational hazards, and space use conflicts, requiring recreational boaters to make adjustments when traveling to or nearby the NY Bight lease areas. In addition, a greater number of structures would be visible from the coastline and to recreational boaters with six NY Bight projects, potentially affecting recreational experience. Beneficial impacts from fish aggregation and reef effect would remain minor.

Impacts from vessel traffic would increase under six NY Bight projects due to the higher number of vessels that would be required as compared to one NY Bight project during installation, O&M, and conceptual decommissioning. The number of vessels would increase the likelihood that tourism charters and recreational fishing vessels would change their travel routes, times, or other routines, which could negatively impact their catch or result in increased expenses. However, given the incremental increase in vessel traffic from wind energy development compared to regional vessel traffic, the impact would remain minor**.**

3.6.8.4.3 Cumulative Impacts of Alternative B

The construction and installation, O&M, and conceptual decommissioning of six NY Bight projects would contribute to the impacts on recreation and tourism from ongoing and planned activities in the geographic analysis area. BOEM anticipates that the cumulative impacts associated with six NY Bight projects when combined with past, present, and planned activities would be temporarily disruptive during the construction and conceptual decommissioning phases and would result in some long-term impacts associated with the presence of structures. The cumulative impacts would be similar to the impacts discussed for six NY Bight projects above. If construction of the six NY Bight projects is staggered or geographically dispersed onshore, impacts would be further minimized. The six NY Bight projects would contribute a noticeable increase to the minor to moderate and minor beneficial impacts on recreation and tourism from the combination of the six NY Bight projects and other ongoing and planned activities.

3.6.8.4.4 Conclusions

Impacts of Alternative B. Construction and installation, O&M, and conceptual decommissioning of one NY Bight project under Alternative B would likely have **negligible** to **minor** impacts and **minor beneficial** impacts on recreation and tourism. Short-term impacts would occur during construction related to noise, anchored vessels, and hindrances to navigation from the installation of the export cable and WTGs. The long-term presence of cable hardcover and structures in the lease area during operations would also result in impacts on recreational vessel navigation and visual quality. Six NY Bight projects would likely have increased **minor** to **moderate** impacts, as result of the increased number of WTGs and increased construction impacts, and **minor beneficial** impacts.

Cumulative Impacts of Alternative B: In context of reasonably foreseeable environmental trends, the impacts contributed by six NY Bight projects to the cumulative impacts on recreation and tourism would be noticeable and would likely contribute to the **minor** to **moderate** impacts and **minor beneficial** impacts. The main drivers for this impact rating are the impacts on fishing and other recreational activity from noise, vessel traffic, and cable emplacement during construction; visual impacts associated with the presence of structures and lighting; and beneficial impacts on fishing from the reef effect.

3.6.8.5 Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage – Recreation and Tourism

Alternative C, the Proposed Action, considers the potential impacts of future offshore wind development for the NY Bight Area with the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. Alternative C consists of two sub-alternatives – Sub-alternative C1: Previously Applied AMMM Measures, and Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures. The analysis for Sub-alternative C1 is presented as the change in impacts from those impacts discussed under Alternative B, and the analysis for Sub-alternative C2 is presented as the change from those impacts discussed in Sub-alternative C1. Refer to Table G-1 in Appendix G, *Mitigation and Monitoring*, for a complete description of AMMM measures that make up the Proposed Action.

3.6.8.5.1 Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures

Sub-alternative C1 analyzes AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS and through related consultations (Table 3.6.8-4).

Table 3.6.8-4. Summary of previously applied avoidance, minimization, mitigation, and monitoring measures for recreation and tourism

Measure ID	Measure Summary
MUL-37	This measure requires implementation of ADLS to turn aviation obstruction lights on and off in response to detection of nearby aircraft, which would reduce total nighttime lighting on WTGs and OSSs.

Impacts of One Project

The implementation of MUL-37 could reduce some of the impacts from lighting associated with Alternative B on recreation and tourism. Impacts for other IPFs would remain the same as described under Alternative B. An ADLS system (MUL-37) would activate a hazard lighting system in response to detecting nearby aircraft and would result in shorter-duration night sky impacts. For comparison, the nearby Empire Wind (OCS-A 0512) ADLS-controlled obstruction lights are estimated to be activated for 357 hours, 46 minutes, and 45 seconds over a 1-year period, 7.5 percent of the normal operating time that would occur without ADLS. This would likely reduce the potential impacts from nighttime lighting on recreational viewer experience from minor to negligible.

Impacts of Six Projects

For six NY Bight projects, MUL-37 would be implemented the same as described for one NY Bight project but would cover a larger geographic area and potentially affect more tourism-based businesses and recreational activities. ADLS on WTGs/OSSs of all six NY Bight leases (MUL-37) would substantially reduce the amount of nighttime lighting compared to Alternative B, reducing the impact from lighting to negligible.

Cumulative Impacts of Sub-alternative C1 (Preferred Alternative)

Under Sub-alternative C1, cumulative impacts on recreation and tourism are anticipated to be similar as described under Alternative B, except that implementation of ADLS on six NY Bight projects (MUL-37) in combination with ongoing and planned projects would reduce offshore lighting impacts to negligible.

3.6.8.5.2 Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures

Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. However, BOEM has not identified any AMMM measures under Sub-alternative C2 that were not previously applied. Therefore, the impacts on recreation and tourism under Sub-alternative C2 are the same as for Sub-alternative C1.

3.6.8.5.3 Conclusions

Impacts of Alternative C. The construction, installation, and conceptual decommissioning for one NY Bight project under Sub-alternative C1 and Sub-alternative C2 would likely have **negligible** to **minor** impacts and **minor beneficial** impacts on recreation and tourism, while impacts on recreation and tourism for six NY Bight projects would be **minor** to **moderate** and **minor beneficial** under Sub-alternative C1 and Sub-alternative C2. The AMMM measure that would be implemented under Sub-alternative C1 and Sub-alternative C2 would reduce lighting impacts but would not reduce the overall impact level.

Cumulative Impacts of Alternative C. In context of reasonably foreseeable environmental trends, the impacts contributed by Sub-alternative C1 and Sub-alternative C2 to cumulative impacts on recreation and tourism would be noticeable. The AMMM measure that would be implemented under Sub-alternative C1 and Sub-alternative C2 would minimize impacts from lighting. BOEM anticipates that the cumulative impacts on recreation and tourism in the geographic analysis area from six NY Bight projects under Sub-alternative C1 and Sub-alternative C2 combined with ongoing and planned activities would likely be **negligible** to **moderate** and **minor beneficial**.

3.6.8.6 Recommended Practices for Consideration at the Project-Specific Stage

BOEM is recommending that lessees consider analyzing RPs in Table 3.6.8-5 to further reduce potential recreation and tourism impacts. Refer to Table G-2 in Appendix G for a complete description of the RPs.

Table 3.6.8-5. Recommended practices for recreation and tourism impacts and related benefits

Recommended Practice	Potential Benefit
MUL-5: Use equipment, technology, and best practices to produce the least amount of noise possible to reduce noise impacts.	Using equipment and technology to limit noise levels could reduce interference with recreational activity near onshore construction sites as a result of construction noise. The NY Bight projects would also have to comply with applicable state or local noise regulations, which would ensure noise levels are within appropriate limits.
REC-1: Schedule nearshore construction activities outside of the summer months to avoid tourist season.	Scheduling onshore and nearshore construction outside of the busy summer tourist season would minimize effects on recreational activities and tourism-based businesses. Increased vehicle traffic, road closures, and potential limitations on recreational access would still occur, but they would affect fewer visitors and summertime recreational activities.

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Appendix G: Mitigation and Monitoring

The Final Programmatic Environmental Impact Statement (PEIS) assesses the potential physical, biological, socioeconomic, and cultural impacts that could result from the construction and installation, operations and maintenance (O&M), and conceptual decommissioning of wind energy projects within the six New York Bight (NY Bight) lease areas, as well as the change in those impacts with avoidance, minimization, mitigation, and monitoring (AMMM) measures. The Proposed Action (Sub-alternative C1 [Preferred Alternative] and Sub-alternative C2) for the Final PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. The Bureau of Ocean Energy Management (BOEM) may require some or all of these measures as conditions of approval for activities proposed by lessees in Construction and Operations Plans (COPs) submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific National Environmental Policy Act (NEPA) analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. The AMMM measures analyzed in the Final PEIS under the Proposed Action are presented in Table G-1.

BOEM identified the AMMM measures analyzed in the Final PEIS from review of offshore wind COPs; COP environmental impact statements (EISs); scoping comment letters; input from cooperating and participating agencies, and Cooperating Tribal Governments; public comments on the Draft PEIS; internal input; and through previous consultations. BOEM analyzed AMMM measures that would be applicable to more than one NY Bight lease area, are reasonable and enforceable, and allow for flexibility where appropriate. These AMMM measures are considered programmatic insofar as they may be applied to COPs for the six NY Bight lease areas, not because they necessarily will apply to COPs under BOEM's renewable energy program outside of the NY Bight lease areas.

Most of the AMMM measures included in this appendix have been previously required by BOEM as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations while a smaller number of measures have not been previously applied. Table G-1 identifies these measures as "Previously Applied" and "Not Previously Applied" in the last column of the table. As part of the Proposed Action, Sub-alternative C1 includes previously applied measures, and Sub-alternative C2 includes previously applied measures and not previously applied measures.

In addition to the AMMM measures, BOEM has identified Recommended Practices (RPs) for the offshore wind industry in Table G-2. These RPs are not part of the Proposed Action. Please note that not all of these RPs are within BOEM's statutory and regulatory authority; those that are not may be adopted and imposed by other governmental agencies at the subsequent COP NEPA stage.

The environmental decision document for each COP-specific NEPA review will describe the specific terms and conditions of the AMMM measures for which compliance is required (40 Code of Federal

Regulations [CFR] 1505.3). All NY Bight lessees will be required to certify compliance with their COP terms and conditions, under 30 CFR 285.633(a). Furthermore, pursuant to 30 CFR 585.634(b), BOEM will periodically review the activities conducted under the approved COPs for the six NY Bight lease areas with the frequency and extent of the review based on the significance of any changes in available information and on onshore or offshore conditions affecting, or affected by, the activities conducted under the COPs.

Monitoring may be required to evaluate the effectiveness of AMMM measures or to identify if resources are responding as predicted to impacts from each NY Bight project. This monitoring would typically be developed in coordination among BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to (1) alter how an AMMM measure identified in the ROD is being implemented, (2) revise or develop new mitigation or monitoring measures for which compliance would be required under the COPs for the six NY Bight lease areas in accordance with 30 CFR 285.633(b)(2), (3) develop measures for future projects, or (4) contribute to regional efforts for better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g., potential cumulative impact assessment tool).

Table G-1. Proposed Action AMMM Measures

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
Previously Applied					
BB-1	Immediate reporting of injured/dead ESA-listed birds and bats	Any occurrence of dead or injured ESA-listed birds or bats, or eagles protected under the Bald and Golden Eagle Protection Act, must be reported to BOEM, BSEE, and USFWS as soon as practicable (taking into account crew and vessel safety), ideally within 24 hours and no more than 72 hours after the sighting. If practicable, the Lessee must carefully collect the dead specimen and preserve the material in the best possible state, contingent on the acquisition of any necessary wildlife permits and compliance with the Lessee's health and safety standards. Occurrences of bird and bat carcasses must also be reported in the Injury and Mortality Reporting (IMR) System.	Bats, Birds	BOEM, BSEE, and USFWS	Previously Applied
BB-2	Injured/dead bird and bat reporting	The Lessee must submit an annual report covering each calendar year, due by January 31, documenting any dead or injured birds or bats found on vessels and structures during construction, operations, and decommissioning in the preceding year. The report must be submitted to BOEM, BSEE, and USFWS. The report must contain the following information: the name of species, date found, location, a picture to confirm species' identity (if possible), and any other relevant information. Carcasses with federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory. Developers should also report any other form of tag such as MOTUS or satellite. Occurrences of bird and bat carcasses must also be reported in the Injury and Mortality Reporting (IMR) System.	Bats, Birds	BOEM, BSEE, and USFWS	Previously Applied
BB-3	Bird and bat monitoring	**Bird and Bat Post-Construction Monitoring Plan.** The Lessee must develop and implement a Bird and Bat Post-Construction Monitoring Plan (BBPCMP) based on the Lessee's Bird and Bat Post-Construction Monitoring Framework (RP BB-4), in coordination with USFWS, and other relevant regulatory agencies. Prior to, or concurrent with, offshore construction activities, including seabed preparation activities, the Lessee must submit a BBPCMP for BOEM, BSEE and USFWS (New York and New Jersey Field Offices) review. BOEM, BSEE, and USFWS will review the BBPCMP and provide any comments on the plan within 60 days of its submittal. The Lessee must resolve all comments on the BBPCMP to BOEM's and BSEE's satisfaction before implementing the plan and before commissioning the first WTG. **Monitoring.** The Lessee must conduct monitoring as outlined in the BBPCMP, which must include use of radio-tags to monitor movement of ESA-listed birds in the vicinity of the project. The BBPCMP will allow for changing methods over time in order to regularly update and refine collision estimates for listed birds. Specific to this purpose, the plan must include an initial monitoring phase involving deployment of Motus radio tags, or similar technology, on listed birds or other species of concern in conjunction with installation and operation of Motus receiving stations on WTGs in the lease area following offshore Motus recommendations (https://motus.org/groups/atlantic-offshore-wind/). The initial phase, which will last for the first few years of operation, may also include deployment of satellite-based tracking technologies (e.g., Global Positioning System [GPS], Argos tags, acoustic bat detectors, or integrated multi-sensor systems). The monitoring may also include measurement of avoidance behavior and densities. **Annual Monitoring Reports.** The Lessee must submit to BOEM (at renewable_reporting@boem.gov), USFWS, and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring within 12 months. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. BOEM, BSEE, and the USFWS shall use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the BBPCMP. BOEM and BSEE reserve the right to require reasonable revisions to the BBPCMP and may require the use of new technologies as they become available for use in offshore environments. **Post-Construction Quarterly Progress Reports**. The Lessee must submit quarterly progress reports during the implementation of the BBPCMP to BOEM (at renewable_reporting@boem.gov), BSEE, and USFWS by the 15th day of the month following the end of each quarter during the first full year that the project is operational. The progress reports must include a summary of all post-construction monitoring performed, an explanation of overall progress, and any technical problems encountered. **Monitoring Plan Revisions.** Within 30 days of submitting the annual monitoring report, the Lessee must meet with BOEM, BSEE, USFWS, and appropriate state agencies to discuss the following: the monitoring results; the potential need for revisions to the BBPCMP, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If, based on this annual review meeting, BOEM, in consultation with USFWS, determines that revisions to the BBPCMP are necessary, BOEM will require the Lessee to modify the BBPCMP. If the projected collision levels, as informed by monitoring results, deviate substantially from the Final COP NEPA effects analysis, the Lessee must transmit recommendations for new mitigation measures and/or monitoring methods to BOEM. In consultation with USFWS, BOEM and BSEE may adjust the frequency, duration, and methods for various monitoring efforts in future revisions of the BBPCMP based on current technology (including its cost) and the evolving weight of evidence regarding the likely levels of collision mortality for each listed bird species. **Operational Reporting (Operations)**. The Lessee must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition data for all WTGs together in tabular format: the proportion of time the WTGs were operational (monthly revolutions per minute [rpm]), the average rotor speed (rpm) of spinning WTGs plus 1 standard deviation, and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. Any operational data considered by the Lessee to be privileged or confidential must be clearly marked as confidential business information and will be handled by BOEM and BSEE in a manner consistent with 30 CFR 585.114. **Raw Data.** The Lessee must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to BOEM, BSEE and USFWS upon request for the duration of the lease. The Lessee must work with BOEM to ensure the data are publicly available. All avian tracking data (i.e., from radio and satellite transmitters) must be stored, managed, and made available to BOEM, BSEE, and USFWS following the protocols and procedures outlined in the agency document entitled *Guidance for Coordination of Data from Avian Tracking Studies*, or its successor applicable at the time the particular data is being stored. All bat data must be stored in the North American Bat Monitoring Program (NABat) database.	Bats, Birds	BOEM, BSEE, and USFWS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
BEN-1	Boulder avoidance, identification, and relocation	The Lessee must avoid boulders greater than 0.5 m in diameter within the lease area and along the export cable corridor; if avoidance is not possible, the Lessee must minimize the distance a boulder must be relocated if necessary for the installation of facilities. If the Lessee needs to relocate boulders, it must submit a Boulder Identification and Relocation Plan. The plan must detail, to the extent technically and/or economically practicable or feasible for the project, how the Lessee will relocate boulders as close as practicable to areas immediately adjacent to existing similar habitat. The plan must be submitted to BOEM and BSEE to coordinate with NMFS for review prior to boulder relocation activities. The Lessee must resolve all comments on the Boulder Relocation Plan to BOEM and BSEE's satisfaction prior to implementation of the plan. If BOEM or BSEE do not provide comments on the plan within 60 days of its submittal, then the Lessee may presume concurrence with the plan. The plan must include sufficient scope to mitigate boulders for facility installation and operation risks.	Benthic; Finfish, Invertebrates, and EFH; Commercial and For-Hire Fishing	BOEM, BSEE, and NMFS	Previously Applied
MUL-41 (Previously BEN-2)	Foundation scour protection monitoring	The Lessee must inspect scour protection performance. The Lessee must submit an Inspection Plan to BSEE with the appropriate FDR submittal. BSEE will review the Inspection Plan and provide comments, if any, on the plan within 60 days of its submittal. The Lessee must resolve all comments on the Inspection Plan to BSEE's satisfaction and receive BSEE's concurrence prior to initiating the inspection program. If BSEE does not send comments within 60 days, the Lessee may presume concurrence. • The Lessee must carry out an initial foundation scour inspection of each foundation within 6 months of completing installation of that foundation, thereafter at intervals not greater than 5 years, and within 180 days after a storm event (as defined by the Post-Storm Event Monitoring Plan, described in MUL-16). • The Lessee must provide BSEE with a foundation scour monitoring report within 90 days of completing each foundation scour inspection. If multiple foundation locations are inspected within a single survey effort, the foundation scour monitoring reports for those locations may be combined into a single foundation scour monitoring report to be provided within 90 days of completing the last foundation scour inspection within this single survey effort. The schedule of reporting must be included in the Inspection Plan and concurred with by BSEE. • If scour protection losses develop within 10% of the maximum loss allowance, edge scour develops within 10% of the maximum allowance, or if spud depressions from installation affect scour protection stability, the Lessee must submit a plan for additional monitoring and/or mitigation to BSEE for review and concurrence.	Benthic; Finfish, Invertebrates, and EFH	BOEM, BSEE, and NMFS	Previously Applied
BIR-1	Bird-Deterrent Devices and Plan	To minimize attracting birds to operating WTGs, the Lessee must install bird perching-deterrent device(s) on each WTG and OSS. The Lessee must submit a plan to deter perching on offshore infrastructure by roseate terns and other marine birds for BOEM and BSEE to review in coordination with USFWS and with the FIR ("Bird Perching Deterrent Plan"). BOEM, BSEE, and USFWS will review the Bird Perching Deterrent Plan and provide any comments on the plan within 60 days of its submittal. The Lessee must resolve all comments on the Bird Perching Deterrent Plan to the satisfaction of BOEM and BSEE before implementing the plan. The Bird Perching Deterrent Plan must include the type(s) and locations of bird perching-deterrent devices and a monitoring plan for the life of the project, must allow for modifications and updates as new information and technology becomes available, and must track the efficacy of the deterrents. The plan must be based on best available science regarding the effectiveness of perching-deterrent devices on minimizing collision risk. The location of bird perching-deterrent devices must be proposed by the Lessee based on BMPs applicable to the appropriate operation, effectiveness, and safe installation of the devices. The Lessee must also provide the location and type of bird-deterrent devices as part of the as-built submittals to BSEE.	Birds	BOEM, BSEE, and USFWS	Previously Applied
BIR-2	Light impact reduction for birds	Nothing in this condition supersedes or is intended to conflict with lighting, marking, and signaling requirements of FAA, USCG, or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable, including lighting designed to minimize upward illumination. The Lessee must provide USFWS with a courtesy copy of the final Lighting, Marking, and Signaling Plan, and the Lessee's approved application to USCG to establish Private Aids to Navigation (PATON).	Birds	FAA, USCG, BOEM, and BSEE	Previously Applied
BIR-3	Compensatory Mitigation Plan for Piping Plover and Red Knot	At least 180 days prior to the start of commissioning of the first WTG, the Lessee would distribute a Compensatory Mitigation Plan for piping plovers and red knot to BOEM, BSEE, and USFWS for review and comment. BOEM, BSEE, and USFWS would review the Compensatory Mitigation Plan and provide any comments on the plan to the Lessee within 60 days of its submittal. The Lessee would resolve all comments on the Compensatory Mitigation Plan to BOEM, BSEE, and USFWS's satisfaction before implementing the plan and before commissioning of the first WTG. The Compensatory Mitigation Plan would provide compensatory mitigation actions to fully offset the impact of the incidental take of piping plover and red knot. The Compensatory Mitigation Plan would require that the compensatory mitigation be implemented by the fifth year of WTG operation. The Lessee will review the effectiveness of the plan with BOEM, BSEE and USFWS at regular (5-year) intervals thereafter or as new information becomes available, during which alternative and adaptive strategies might be considered. The Compensatory Mitigation Plan would include: (1) a quantification of the level of offsets to fully offset the impact of the incidental take expressed in the Incidental Take Statement, based on scientifically recognized techniques and methodologies for each of the impacted species: piping plover and red knot; (2) detailed description of the mitigation actions for each species (Piping plover examples: Habitat enhancement, predator control, reduction of disturbance at wintering sites, etc. Rufa red knot examples: habitat restoration, reduce displacement from peregrine falcons, red tide rehabilitation, etc.); (3) the specific location for each mitigation action; (4) a timeline for completion of the mitigation measures; (5) details of the mitigation mechanisms (e.g., conservation bank, in-lieu fee, applicant-proposed mitigation); (6) best available science linking the compensatory mitigation action(s) to the projected level of collision mortality; and (7) monitoring and reporting to ensure the effectiveness of the mitigation actions in offsetting take.	Birds	BOEM, BSEE, and USFWS	Previously Applied
COMFIS-2	Scour and cable protection plan	The Lessee must prepare and implement a Scour and Cable Protection Plan(s) that includes descriptions and specifications for all scour and cable protection materials. The plan(s) must include depictions of the location and extent of scour and cable protection, the habitat delineations for the areas of cable protection measures, and detailed information on the proposed scour or cable protection materials for each area and habitat type. The Scour and Cable Protection Plan(s) must demonstrate consistency with the Micrositing Plan(s) and Sequencing Plan(s), as appropriate. a. The Lessee must avoid the use of engineered stone or concrete mattresses in complex habitat, as practicable and feasible. The Lessee must ensure that all materials used for scour and cable protection measures consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-	Commercial and For-Hire Fishing	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		dimensional complexity in height and in interstitial spaces, as practicable and feasible. If concrete mattresses are necessary, bioactive concrete (i.e., with bio-enhancing admixtures) must be used as practicable as the primary scour protection (e.g., concrete mattresses) or veneer to support biotic growth. b. Cable protection measures must have tapered or sloped edges to reduce hangs for mobile fishing gear. The Lessee must avoid the use of plastics/recycled polyesters/net material (i.e., rock-filled mesh bags, fronded mattresses) for scour protection. c. The Scour and Cable Protection Plan(s) must be submitted to BOEM and BSEE for coordination with other agencies as appropriate for review prior to placement of scour and cable protection within the area covered by the scope of the Plan(s). The Scour and Cable Protection Plan(s) must be concurred with by BOEM and BSEE prior to BSEE issuing a no-objection to the relevant FDR. d. The Lessee must resolve all comments on each Plan to BOEM's and BSEE's satisfaction before placement of the scour and cable protection materials. The final version of the Scour and Cable Protection Plan(s) must be provided to BOEM, BSEE, NMFS and USACE.			
COMFIS-3	Fisheries & Benthic Habitat Monitoring Plan	The Lessee shall develop and implement a Fisheries and Benthic Habitat Monitoring Plan that should include shellfish, such as surfclam and scallop. The Lessee must submit to BOEM and BSEE a Fisheries and Benthic Habitat Monitoring Plan (FBHMP). The Lessee must conduct fisheries and benthic monitoring according to their FBHMP to assess fisheries and benthic habitat status in the project area.	Commercial and For-Hire Fishing; Benthic	BOEM, BSEE, and NMFS	Previously Applied
COMFIS-6	Fisheries compensatory mitigation	The Lessee will implement the following compensation programs consistent with BOEM's draft guidance for mitigating impacts on commercial fisheries and for-hire recreational fishing (https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf): • A gear loss and damage compensation program to address the impact-producing factor for presence of structures during construction, operations, and decommissioning by reducing impacts resulting from loss of gear associated with uncharted obstructions resulting from the proposed project. • A compensation program for lost income from commercial fisheries and for-hire recreational fishing activities and other eligible fishing interests for lost income during construction and a minimum of 5 years post-construction. ○ The Lessee shall establish a compensation/mitigation fund consistent with BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 to compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity resulting from displacement from fishing grounds due to project construction and operations and to shoreside businesses for losses indirectly related to the project. For losses to commercial and for-hire recreational fishermen, the fund shall be based on the revenue exposure for fisheries based out of ports listed in an individual project's EIS. For losses to shoreside businesses, the Lessee shall analyze the impacts on shoreside seafood businesses adjacent to ports listed in an individual project's EIS.	Commercial and For-Hire Fishing	BOEM, BSEE, NJDEP, and NYDEP	Previously Applied
CUL-2	Marine cultural resources avoidance or additional investigation	BOEM will establish, and the Lessee must comply with, requirements for all avoidance buffers required by BOEM for each marine cultural resource (i.e., archaeological resource and ASLFs) based on the size and dimension of the resource. Avoidance buffers will extend outward from the maximum discernable limit of each resource and are intended to minimize the risk of disturbance during construction. If an adverse effect cannot be avoided, the Lessee will be required to conduct further investigations to minimize or resolve effects on these historic properties. If avoidance of an unevaluated resource is infeasible, additional investigations must be conducted for the purpose of determining eligibility for listing in the NRHP.	Cultural Resources	BOEM or BSEE	Previously Applied
CUL-3	Ancient submerged landform feature (ASLF) monitoring program and marine archaeological post-review discovery plan	BOEM will establish, and the Lessee must comply with, monitoring and post-review discovery plans outlining processes to document and review impacts of construction or any seabed-disturbing activities on marine cultural resources. Such plans may be developed in the course of BOEM's project-level NEPA review and Section 106 consultation on marine archaeological resources. A post-review discovery plan approved by BOEM is also required in the event that an unanticipated discovery and/or inadvertent impact of a marine archaeological resource occurs.	Cultural Resources	BOEM, BSEE, or other agencies that have statutory enforcement authority over cultural resources	Previously Applied
CUL-4	Terrestrial archaeological resource avoidance or additional investigation	BOEM will establish avoidance criteria for any identified terrestrial archaeological historic property or any unevaluated terrestrial archaeological resource. The Lessee must avoid impacts on identified terrestrial archaeological historic properties or unevaluated resources. If avoidance is infeasible, the Lessee must develop a plan to be submitted to BOEM that addresses the adverse effect on the terrestrial archaeological resource. The Lessee may develop this plan in the course of BOEM's project-level NEPA review and Section 106 consultation on terrestrial archaeological resources. Avoidance would entail the development and implementation of avoidance buffers around each historic property and unevaluated resource. If avoidance of an unevaluated resource is infeasible, additional investigations must be conducted for the purpose of determining eligibility for listing in the NRHP.	Cultural Resources	BOEM, BSEE, or other agencies that have statutory enforcement authority over cultural resources	Previously Applied
CUL-5	Terrestrial archaeological resource monitoring program and terrestrial archaeological post-review discovery plan	BOEM will establish, and the Lessee must comply with, monitoring and post-review discovery plans outlining processes to document and review impacts of construction or any ground-disturbing activities on terrestrial archaeological resources. A monitoring plan may be developed in the course of BOEM's project-level NEPA review and Section 106 consultation on terrestrial archaeological resources. A monitoring plan may be required for certain areas, identified through consultation, to ensure impacts on resources are avoided or minimized. A post-review discovery plan will be required for the purposes of establishing a protocol in the event of an unanticipated discovery and/or inadvertent impact on a terrestrial archaeological resource.	Cultural Resources	BOEM, BSEE, or other agencies that have statutory enforcement authority over cultural resources	Previously Applied
MM-1	Reporting of all NARW detections	If a NARW is observed at any time by PSOs or personnel on any project vessels, or during any project-related activity including during vessel transit, the Lessee must immediately report the sighting information to BOEM (renewable_reporting@boem.gov), BSEE (TIMSWeb and notification email to protectedspecies@bsee.gov), the NMFS hotline, the WhaleAlert App (https://www.whalealert.org/), and to the USCG via channel 16, as soon as feasible but no later than 24 hours after the sighting. • If in the Greater Atlantic Region (ME to VA/NC border), call (866-755-6622); • If in the Southeast Region (NC to FL), call (877-WHALE-HELP or 877-942-5343); or • If calling the hotline is not possible, reports can also be made to the U.S. Coast Guard via channel 16. The sighting report must include the time in Coordinated Universal Time (UTC; HH:MM), date (YYYY-MM-DD), location (latitude/longitude in decimal degrees; coordinate system used) of the sighting, number of whales, animal description/certainty of sighting (provide photos/video if taken), closest point of approach,	Marine Mammals	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		activities at time of detection, vessel speed, animal behavior, lease area/project name, PSO/personnel name, PSO provider company [if applicable], and reporter's contact info. If a NARW is detected via PAM, the date, time, location (i.e., latitude and longitude of recorder) of the detection as well as the recording platform that had the detection must be reported to nmfs.pacmdata@noaa.gov as soon as feasible, but no longer than 24 hours after the detection. Full detection data and metadata must be submitted monthly on the 15th of every month for the previous month via the webform on the NMFS North Atlantic Right Whale Passive Acoustic Reporting System website at https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates. The Lessee must send a summary report within 24 hours to NMFS GARFO-PRD and NMFS-OPR with the information submitted to the hotline/template and confirmation the sighting/detection was reported to the respective hotline, the vessel/platform from which the sighting/detection was made, activity the vessel/platform was engaged in at time of sighting/detection, project construction and/or survey activity ongoing at time of sighting/detection (e.g., pile driving, cable installation, HRG survey), distance from vessel/platform to animal at time of initial sighting/detection, closest point of approach of whale to vessel/platform, vessel speed, and any mitigation actions taken in response to the sighting/detection.			
MM-3	Long-term PAM monitoring	The Lessee must conduct long-term monitoring of ambient noise as well as baleen whale and commercially-important fish vocalizations in the lease area before, during, and following construction. The Lessee must conduct continuous recording at least 1 year before construction, during construction, initial operation, and for at least 3 but no more than 10 full calendar years of operation to monitor for potential noise impacts. The Lessee must meet with BOEM and BSEE at least 60 days prior to conclusion of the third full calendar year of operation monitoring (and at least 60 days prior to the conclusion of each subsequent year until monitoring is concluded) to discuss: 1) monitoring conducted to-date, 2) the need for continued monitoring, and 3) if monitoring is continued, whether adjustments to the monitoring are warranted. The instrument(s) must be configured to ensure that the specific locations of vocalizing NARW anywhere within the lease area could be identified, based on the assumption of a 10 km detection range for their calls. The lessee may execute the implementation of this condition through Option 1 or Option 2, as below, but must notify BOEM of its choice at least 120 days before pile driving is scheduled to begin. The timing requirement (i.e., monitoring for at least 3 but no more than 10 full calendar years of operation) will be reevaluated by BOEM and BSEE at the end of the third year and each year subsequently thereafter at the request of the Lessee (at a maximum frequency of requests of once per year). **A. Option 1 - Lessee Conducts Long-term Passive Acoustic Monitoring (PAM).** The Lessee must conduct PAM, including data processing and archiving following the Regional Wildlife Science Collaborative (RWSC) best practices to ensure data comparability and transparency. PAM instrumentation must be deployed to allow for identification of any NARW that vocalize anywhere within the lease area. The sampling rate (minimum 10 kHz) of the recorders must prioritize baleen whale detections, but must also have a minimum capability to record noise from vessels, pile driving, and WTG operation in the lease area. The system must be configured for continuous recording over the entire year. If temporal gaps in recording are expected, the Lessee must ensure that additional recorders can be deployed to fill gaps. The Lessee must use trawl-resistant moorings to ensure that instruments are not lost and must replace any lost instruments as soon as possible. The Lessee must also notify BOEM if such loss and replacement occur. The Lessee must follow the best practices outlined in the RWSC best practices document, unless otherwise required through conditions of COP approval or related consultation. The best practices include engaging with the RWSC, calibrating the instruments, running QA/QC on the raw data, following the templates for reporting species vocalizations, and preparing the data for archiving at National Centers for Ecological Information (NCEI). In terms of data processing, the Lessee must document the occurrence of whale vocalizations (calls of NARW, humpback, sei, fin, and minke whales, as well as odontocete clicks, as available based on sample rate) using automatic or manual detection methods. In addition, data must be processed with either manual or automatic detection software to detect vocalizations of spawning cod. The Lessee must submit a log of these detections as well as the detection methodology to BOEM (at renewable_reporting@boem.gov), BSEE (at protectedspecies@bsee.gov) and NMFS (at nmfs.nec.pacmdata@noaa.gov.) within 120 days following each recorder retrieval. All raw data must be sent to the NCEI Passive Acoustic Data archive on an annual basis and the Lessee must follow NCEI guidance for packaging the data and must pay the fee. • Long-term Passive Acoustic Monitoring Plan. The Lessee must prepare and implement a Long-term PAM Plan under this option. No later than 120 days prior to instrument deployment and before any construction begins, the Lessee must submit to BOEM and BSEE (renewable_reporting@boem.gov and OSWsubmittals@bsee.gov) the Long-term PAM Plan that describes all proposed equipment (including number and configuration of instruments), deployment locations, mooring design, detection review methodology, and other procedures and protocols related to the required use of PAM. As the Lessee prepares the Long-term PAM Plan, it must coordinate with the RWSC. BOEM and BSEE will review the Long-term PAM Plan and provide comments, if any, on the plan within 45 days of its submittal. The Lessee may be required to submit a modified Long-term PAM Plan based on feedback from BOEM and BSEE. The Lessee must address all outstanding comments to BOEM's and BSEE's satisfaction and will need to receive written concurrence from BOEM and BSEE. If BOEM or BSEE do not provide comments on the Long-term PAM Plan within 45 days of its submittal, the Lessee may conclusively presume BOEM's and BSEE's concurrence with the Long-term PAM Plan. **B. Option 2 – Economic and Other Contributions to BOEM's Environmental Studies Program.** As an alternative to conducting Long-term PAM in the lease area, the Lessee may opt to make an economic contribution to BOEM's Environmental Studies Partnership for an Offshore Wind Energy Regional Observation Network (POWERON) initiative on an annual basis and cooperate with the POWERON team to allow access to the lease area for deployment, regular servicing, and retrieval of instruments. In the event the Lessee selects this option, BOEM and the Lessee will enter into a separate agreement. The Lessee's economic contribution will provide for all activities necessary to conduct PAM within the lease area, such as vessel and staff time for regular servicing of instruments, QA/QC on data, data processing to obtain vocalizations of sound-producing species and ambient noise metrics, as well as long-term archiving of data at NCEI. At the Lessee's request, the amount of the economic contribution will be estimated by BOEM's Environmental Studies Program. The Lessee will also be invited to contribute to discussions about the scientific approach of the POWERON initiative via the RWSC. The Lessee may request temporary withholding of the public release (placement into the NCEI public data archive) of raw acoustic data collected within the lease area for up to 180 days after it is collected. During this temporary hold, the Lessee may be provided a copy of the raw PAM data that was collected in the lease area or ROW after it has been cleared for any national security concerns under the RWSC best practices document.	Marine Mammals	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
MM-5	Marine Mammal Vessel Strike Management Plan	All project vessels transiting between the operations and maintenance facility and the lease area must travel at 10 knots (18.5 kilometers per hour) or less while operating in a Seasonal Management Area (SMA), unless the Lessee receives concurrence from BOEM and BSEE on its Marine Mammal Vessel Strike Management Plan. The Lessee must submit the Marine Mammal Vessel Strike Management Plan to BOEM, BSEE, and NMFS at least 180 days prior to the Plan's implementation. The plan must describe the location of each transit corridor (with a map); how PAM, in combination with visual observations, will be conducted to ensure highly effective monitoring for the presence of right whales in the transit corridor; and the protocols that will be in place for vessel speed restrictions following detection of a right whale via PAM or visual observation. The Lessee should coordinate with NMFS and monitor updates to the 2022 Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, on additional vessel speed restrictions (https://www.fisheries.noaa.gov/action/amendments-north-atlantic-right-whale-vessel-strike-reduction-rule). This measure does not supersede any regulatory requirements.	Marine Mammals	BOEM, BSEE, and NMFS	Previously Applied
MMST-1	Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan	The Lessee must submit the Reduced Visibility Monitoring (RVMP)/ Nighttime Pile Driving Monitoring Plan (or plans if submitted separately) to BOEM, BSEE, USACE, and NMFS GARFO PRD at least 180 days before pile driving is planned to begin unless a different time period is identified in the project-specific MMPA LOA. BOEM, BSEE, and NMFS will provide comments to the Lessee within 45 days of receipt of the plan. If issues are identified, the Lessee must submit a modified plan to BOEM, BSEE, USACE, and NMFS GARFO PRD within 30 days of the receipt of the comments and at least 15 days before the start of pile driving and associated activity. The plan may not be implemented, and therefore pile driving may not begin, until BOEM and BSEE inform the Lessee that they concur with the plan. • The plan must contain a thorough description of how the Lessee will monitor pile-driving activities during reduced visibility conditions (e.g. rain, fog) and at night, including proof of the efficacy of monitoring devices (e.g., mounted thermal/infrared camera systems, hand-held or wearable night vision devices, spotlights) in detecting ESA-listed marine mammals and sea turtles over the full extent of the required clearance and shutdown zones, including demonstration that the full extent of the minimum visibility zones (determined at the project-specific stage) can be effectively and reliably monitored in reduced visibility conditions. The plan must identify the efficacy of the technology at detecting marine mammals and sea turtles in the clearance and shutdown zones. The plan must include a full description of the proposed technology, monitoring methodology, and data demonstrating that marine mammals and sea turtles can reliably and effectively be detected within the clearance and shutdown zones for monopiles before, during, and after impact pile driving at night. Additionally, this plan must contain a thorough description of how the Lessee will monitor pile-driving activities during daytime when unexpected changes to lighting or weather occur during pile driving that prevent visual monitoring of the full extent of the clearance and shutdown zones. Without concurrence on this plan, no pile driving may be initiated later than 1.5 hours prior to civil sunset.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-2	Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving	The Lessee must submit a Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving to BOEM, BSEE, USACE, NMFS GARFO PRD, and NMFS OPR at least 180 days before any foundation pile driving is planned. BOEM, BSEE, NMFS GARFO PRD, and NMFS OPR will review the plan and provide comments within 45 days of receipt of the plan. If the plan is determined to be insufficient, the Lessee must submit a modified plan that addresses the identified issues no more than 30 days after receipt of comments from NMFS; at that time, BOEM, BSEE, NMFS GARFO PRD, and NMFS OPR will discuss a timeline for review and approval of the modified plan to meet the Lessee's schedule to the maximum extent practicable. The Lessee must obtain BOEM's and BSEE's concurrence with the Marine Mammal and Sea Turtle Monitoring Plan before starting any pile driving. The plan(s) must include: a description of how all relevant mitigation and monitoring requirements contained in the project-specific NMFS BiOp ITS will be implemented, a pile driving installation summary and sequence of events, a description of all training protocols for all project personnel (PSOs, PAM Operators, trained crew lookouts, etc.), a description of all monitoring equipment and evidence (i.e., manufacturer's specifications, reports, testing) that the Lessee can use to effectively monitor and detect ESA-listed marine mammals and sea turtles in the identified clearance and shutdown zones (i.e., field data demonstrating reliable and consistent ability to detect ESA-listed large whales and sea turtles at the relevant distances in the conditions planned for use), communications and reporting details, and PSO monitoring and mitigation protocols (including number and location of PSOs) for effective observation and documentation of sea turtles and ESA-listed marine mammals during all pile-driving events. The plan(s) must demonstrate sufficient PSO and PAM Operator staffing (in accordance with watch shifts), PSO and PAM Operator schedules, and contingency plans for instances if additional PSOs and PAM Operators are required. The Plan must detail all plans and procedures for sound attenuation, including procedures for adjusting the noise attenuation system(s) and available contingency noise attenuation measures/systems if distances to modeled isopleths of concern are exceeded during SFV. The plan must also describe how the Lessee would determine the number of sea turtles exposed to noise above the 175 dB harassment threshold during impact pile driving of WTG and OSS foundations and how the Lessee would determine the number of ESA-listed whales exposed to noise above the Level B harassment threshold during impact pile driving of WTG and OSS foundations. If any clearance or shutdown zones are expanded, the Lessee must submit a proposed monitoring plan describing the location of all PSOs to NMFS, BOEM, and BSEE for review. The Lessee must resolve BOEM's and BSEE's comments to the proposed monitoring plan to the Bureaus' satisfaction and must conduct activities in accordance with the plan.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-3	Pile-driving clearance and shutdown zone adjustments	Based on sound field verification results, the agencies (BOEM, BSEE, NMFS, and USACE, when applicable) will discuss the possibility of either increasing or decreasing the clearance zones, shutdown zones, and monitoring and mitigation measures for pile driving. The agencies will communicate with the Lessee about how to proceed.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-4	Establishment of foundation pile-driving measures	1. If shutdown is called for but the Lessee determines shutdown is not technically feasible due to human safety concerns or to maintain installation feasibility, reduced hammer energy must be implemented when the lead engineer determines it is technically feasible to do so. 2. Time of Day Restrictions: Foundation pile driving may commence only during daylight hours, unless an RVMP/Nighttime Pile Driving Monitoring Plan has been submitted and approved (see MMST-1). Foundation pile driving may begin no earlier than 1 hour after (civil) sunrise. Foundation pile driving may not be initiated any later than 1.5 hours before (civil) sunset. Foundation pile driving may continue after dark only when the installation of the same pile began during daylight hours (1.5 hours before civil sunset), when clearance zones were fully visible for at least 30 minutes and only when they must proceed for human safety or installation feasibility reasons. 3. The Lessee must deploy at least two PSOs on duty on the foundation pile-driving platform, or nearby construction vessel in the immediate vicinity of the foundation pile-driving platform, at all times during foundation pile driving to visually monitor for marine mammals.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		4. Monitoring must take place from 60 minutes immediately prior to initiation of foundation pile-driving activity through 30 minutes post-completion of foundation pile-driving activity. Acoustic PSOs (at least one PAM operator) must review data from at least 24 hours prior to pile driving and actively monitor hydrophones for 60 minutes prior to pile driving. 5. For all foundation pile-driving activity, the Lessee must implement designated clearance zones. 6. Foundation pile driving may only commence when the clearance zones are fully visible (e.g., not obscured by darkness, rain, fog), unless an RVMP/Nighttime Pile Driving Monitoring Plan (see MMST-1) has been submitted and approved, and only when clearance zones are clear of marine mammals for at least 30 minutes immediately prior to foundation pile driving, as determined by the lead PSO. 7. If a marine mammal is visually detected entering or within designated shutdown zones after foundation pile driving has commenced, a shutdown of foundation pile driving must be implemented. 8. Following a shutdown, foundation pile driving may not commence until appropriate conditions (i.e., measures 1–5 above) have been met. 9. Pile driving of wind turbine foundations and OSSs in the lease area must not occur from January 1 through April 30. Impact pile driving must not occur in December unless unanticipated delays due to weather or technical problems arise, notified to and approved by BOEM, that necessitate extending impact pile driving into December. **For sea turtles:** To ensure that foundation pile-driving operations are carried out in a way that minimizes the exposure of listed sea turtles to noise that may result in injury or behavioral disturbance, PSOs will establish a shutdown zone (determined at the project-specific stage) for all foundation pile-driving activities. Adherence to the shutdown zones must be reflected in the PSO reports. Any visual detection of sea turtles within the shutdown zones must trigger the required shutdown in pile installation. Upon a visual detection of a sea turtle entering or within the shutdown zone during foundation pile driving, the Lessee must shut down the pile-driving hammer (unless activities must proceed for human safety or for concerns of installation feasibility) from when the PSO observes, until: • The lead PSO verifies that the animal(s) voluntarily left and headed away from the clearance area; or • 30 minutes have elapsed without re-detection of the sea turtle(s) or detection of any sea turtles by the lead PSO.			
MMST-5	PSO coverage of expanded pile-driving clearance/shutdown zones	The Lessee must ensure that, if the clearance and/or shutdown zones are expanded due to sound field verification results (see MMST-3), PSO coverage is sufficient to reliably monitor the expanded clearance and/or shutdown zones. Additional observers must be deployed on additional platforms for every 4,921 feet (1,500 meters) that a clearance or shutdown zone is expanded beyond the distances modeled prior to verification. In the event that the clearance or shutdown zone for sea turtles needs to be expanded, the Lessee must submit a proposed monitoring plan for the expanded zones to BOEM and BSEE, who will coordinate with NMFS GARFO-PRD prior to granting approval. Expansion of the zones will be reconsidered after additional sound attenuation measures are in place that reduce distances to at or below those modeled assuming 10 dB, as verified by SFV. The implementation of expanded clearance/shutdown zone monitoring must be described in the Marine Mammal and Sea Turtle Monitoring Plan (MMST-2).	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-6	Pile-driving visibility requirements	PSOs must have effective visual monitoring in all directions, and pile driving must not commence until all clearance zones are fully visible (i.e., are not obscured by darkness, rain, fog, etc.) for at least 30 minutes. Unless otherwise authorized under an approved RVMP/ Nighttime Pile Driving Monitoring Plan (see MMST-1), construction activities must not be initiated until the full extent of all clearance zones are fully visible if conditions (e.g., darkness, rain, fog) prevent the visual detection of marine mammals in the clearance zones. The lead PSO will make a determination as to when there is sufficient visibility to ensure effective visual monitoring can be accomplished in all directions.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-7	PSO coverage and training requirements for pile driving	The Lessee must ensure that PSO coverage is sufficient to reliably detect whales and sea turtles at the surface in clearance and shutdown zones to execute any pile driving delays or shutdown requirements. If, at any point prior to or during construction, BOEM and BSEE determine the PSO coverage that is included as part of the Proposed Action for the COP NEPA analysis is not sufficient to reliably detect ESA-listed whales and sea turtles within the clearance and shutdown zones, additional PSOs and/or platforms will be deployed. Determinations prior to construction will be based on review of the Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving (MMST-2). Determinations during construction will be based on review of the weekly pile-driving reports and other information, as appropriate. The Lessee must use independent, dedicated, qualified PSOs provided by a third party. The PSOs' sole project-related duty must be to observe, collect and report data, and communicate with and instruct relevant vessel crew regarding the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards). PSOs or any PAM operators serving as PSOs must have completed a commercial PSO training program for the Atlantic with an overall examination score of 80% or greater.[1] Training certificates for individual PSOs must be provided to BOEM or BSEE upon request. PSOs and PAM operators must be approved by NMFS prior to the start of construction activities. Application requirements to become an NMFS-approved PSO for construction activities can be found on the NOAA website[2]. The Lessee must provide to BOEM, upon request, documentation of NMFS approval for individual PSOs. At least one lead PSO must be on duty at any given time as the lead PSO or PSO monitoring coordinator during pile driving. Any required lead PSOs must have prior approval from NMFS to be a lead or unconditionally approved PSO. PSOs on duty must be clearly listed on daily data logs for each shift. A sufficient number of PSOs must be deployed to record data in real time and effectively monitor the affected area for the project, including visual surveys in all directions around a pile, PAM, and continuous monitoring of sighted NARWs in the area. The number of PSOs must meet the requirements for enhanced seasonal monitoring.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

[1] https://repository.library.noaa.gov/view/noaa/15851
[2] https://www.fisheries.noaa.gov/new-england-mid-atlantic/careers-more/protected-species-observer-information-new-england-mid-atlantic-and-southeast

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		PSOs must not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch. PSOs must not work for more than 12 hours in any 24-hour period (Baker et al. 2013) unless an alternative schedule is approved by BOEM. Visual monitoring must occur from the most appropriate vantage point on the associated operational platforms that allows for 360-degree visual coverage around a vessel. The Lessee must ensure that suitable equipment is available to PSOs including binoculars, range-finding equipment, a digital camera, and electronic data recording devices (e.g., a tablet) to adequately monitor the distance of the clearance and shutdown zones, to determine the distance to protected species during surveys, to record sightings and verify species identification, and to record data. PSOs must conduct observations while free from distractions and in a consistent, systematic, and diligent manner.			
MMST-9	Vessel crew and Protected Species Observer (PSO) training requirements	The Lessee must provide project-specific training to all vessel crew members, PSOs, and trained lookouts on the identification of sea turtles and marine mammals, vessel strike avoidance and reporting protocols, how and when to communicate with the vessel operator, the authority of the PSOs, and the associated regulations for avoiding vessel collisions with protected species prior to the start of in-water construction or detonation activities. The Lessee must make available aboard all project vessels reference materials for identifying sea turtles and marine mammals, copies of the Marine Mammal and Sea Turtle Monitoring Plan (MMST-1) and the Marine Mammal Vessel Strike Management Plan (MM-5). Confirmation of the training and understanding of the requirements must be documented on a training course log sheet, and the Lessee must provide the log sheets to BOEM and BSEE upon request. The Lessee must communicate to all crew members its expectation for them to report sightings of sea turtles and marine mammals to the designated vessel contacts. The Lessee must communicate the process for reporting sea turtles and marine mammals (including live, entangled, and dead individuals) to the designated vessel contact and all crew members. The Lessee must post the reporting instructions, including communication channels, in highly visible locations aboard all project vessels.	Marine Mammals, Sea Turtles	BOEM and BSEE	Previously Applied
MMST-10	Reporting of ESA-Listed Species within Shutdown Zone During Active Pile Driving	The Lessee must report any threatened or endangered species that is observed within the identified shutdown zone during active pile driving (vibratory or impact) or drilling. The Lessee must file a report within 48 hours of the incident and include the following: description of the activity (i.e., drilling, vibratory or impact pile driving) and duration of pile driving or drilling prior to the detection of the animal(s), location of PSOs and any factors that impaired visibility or detection ability, time of first and last detection of the animal(s), distance of animal at first detection, closest point of approach of animal to pile, behavioral observations of the animal(s), time the PSO called for shutdown, hammer log (number of strikes, hammer energy), time the pile driving began and stopped, and any measures implemented (e.g., reduced hammer energy) prior to shutdown. If shutdown was determined not to be feasible, the report must include an explanation for that determination and the measures that were implemented (e.g., reduced hammer energy).	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-12	Marine mammal and sea turtle geophysical survey clearance and shutdown zones and mitigations	To avoid injury of and minimize any potential disturbance to protected species, the Lessee must implement the following measures for all vessels using boomer, sparker, bubble gun, and chirp sub-bottom profiler categories of equipment. Shutdown, pre-start clearance, and ramp-up procedures are not required during HRG survey operations using only other sources (e.g., ultra-short baselines, fathometers, parametric shallow penetration sub-bottom profilers, hull-mounted non-parametric SBP, side-scan sonars, pingers, acoustic releases, echosounders, and instruments attached to submersible vehicles (HOV/AUV/ROVs)). • For situational awareness of marine mammals and ESA-listed species that may be in the survey area, during times third-party protected species observers (PSOs) are on duty, they must monitor to the farthest extent practicable, with a primary focus being 200 m around geophysical survey vessels (i.e., the Clearance Zone). At all times PSOs are on duty, any observed species must be recorded (see reporting requirements below). • Any observations of a marine mammal or ESA-listed species by crew members aboard any vessel associated with the survey must be relayed to the PSO on duty. • To minimize exposure of ESA-listed species of marine mammal to noise that could be disturbing, a 200 m Shutdown Zone for North Atlantic right whales and unidentified whales, and a 100-m Shutdown Zone for all other ESA-listed whales visible at the surface must be established around the sound source operating boomer, sparker, or bubble gun equipment. If the Shutdown Zone(s) cannot be adequately monitored for ESA-listed species presence (i.e., PSO discretion determines conditions, including night or other low visibility conditions, are such that listed species cannot be reliably sighted within the Shutdown Zone(s) with the available monitoring equipment), no equipment that requires PSO monitoring can be deployed until such time that the Shutdown Zone(s) can be effectively monitored. • The Shutdown Zone(s) must be monitored by third-party PSOs at all times when boomer, sparker, bubble gun, or Chirp sub-bottom profiler categories of equipment are being operated and all observed ESA-listed species must be recorded. • If an ESA-listed whale is detected within or entering the respective Shutdown Zone, any boomer, sparker, or bubble gun categories of equipment that requires PSOs must be shut off until the minimum separation distance is re-established, and the clearance measures are carried out (200 m for North Atlantic right whales and 100 m for other ESA-listed whales). • A PSO must notify the survey crew that a shutdown of all active boomer, sparker, and bubble gun acoustic sources is immediately required. The vessel operator and crew must comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion must occur only after shutdown. • For all protected species, Clearance Zones of 200 m for all ESA-listed species of marine mammal must be clear of all animals for 30 minutes before ramp-up or any deployed survey equipment is activated. • If any protected species is observed within the respective Clearance Zone during the 30-minute pre-clearance period, the relevant acoustic sources must not be initiated until the ESA-listed whale (or unidentified whale) is confirmed by visual observation to have exited the relevant zone, or, until 30 minutes have elapsed with no further sighting of the animal. • A "ramp up" of the boomer, sparker, or bubble gun survey equipment must occur at the start or re-start of geophysical survey activities when technically feasible. A ramp up must begin with the power for the geophysical survey equipment ramped up to half power for 5 minutes, and then to full power. • Following a shutdown for any reason, ramp up of the equipment may begin immediately only if: (a) the shutdown is less than 30 minutes, (b) visual monitoring of the Shutdown Zone(s) continued throughout the shutdown, (c) the animal(s) causing the shutdown was visually followed and confirmed by PSOs to be outside of	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		the Shutdown Zone(s) and heading away from the vessel, and (d) the Shutdown Zone(s) remains clear of all ESA-listed species. If all the conditions above (a, b, c, and d) are not met, the Clearance Zone distance must be monitored for all ESA-listed species for 30 minutes of pre-clearance observation before noise-producing equipment can be turned back on. • No geophysical surveys may be conducted at night or during low-visibility conditions unless PSOs are able to effectively monitor the full extent of the Clearance and Shutdown Zone(s). • An Alternative Monitoring Plan (AMP) for geophysical surveys must be included with a survey plan detailing the monitoring methodology that will be used during nighttime and low-visibility conditions. The AMP must demonstrate how it will support effective monitoring for the presence of whales and sea turtles in the Clearance and Shutdown Zone(s). The AMP should include information about the distances that whales can be effectively detected using the identified technology/equipment, and any limitations posed by sea state(s) or vessel equipment (e.g., deck lights) that may inhibit the field of view. • The AMP must include technologies that have the technical feasibility to detect all ESA-listed species in the Clearance and Shutdown Zone(s). Low-light equipment (i.e., night-vision goggles and/or infrared technology) must be available for use during low visibility (e.g., inclement weather, nighttime) monitoring. • PSOs must be trained and experienced with any AMP technology used. The AMP must describe how calibration will be performed, for example, by including observations of known objects at set distances and under various lighting conditions. This calibration should be performed during mobilization and periodically throughout the survey operation. • PSOs shall make nighttime observations from a platform with no visual barriers, due to the potential for the reflectivity from bridge windows or other structures to interfere with the use of the night vision optics. • Boomer, sparker, bubble gun, or Chirp sub-bottom profiler sound sources used within the Southeast Right Whale Critical Habitat Unit 2 during the calving and nursing season (December-March) shall not operate at frequencies between 7 kHz and 35 kHz at night or poor visibility (i.e., anytime AMP methods are required). • During good conditions (e.g., daylight hours; Beaufort scale 3 or less) when survey equipment is not operating, to the maximum extent practicable (accounting for recommended shift schedules and vessel activities), PSOs should conduct observations for listed species for comparison of sighting rates and behavior with and without use of active geophysical survey equipment. Any observed listed species must be recorded regardless of any mitigation actions required.			

MMST-14	Vessel strike mitigation measures for marine mammals and sea turtles	The Lessee must comply with the following vessel strike avoidance conditions for any construction, operations, or decommissioning vessel transits associated with the project, unless the safety of the vessel or crew necessitates deviation from these requirements. The Lessee must report any such deviations as set forth in MUL-32.
		• PSO Requirements. The Lessee must ensure that vessel operators and crew members maintain a vigilant watch for marine mammals and sea turtles, and reduce vessel speed, alter the vessel's course, or stop the vessel as necessary to avoid striking marine mammals or sea turtles, consistent with identified requirements.
		  ○ All vessels must have a visual observer on board who is responsible for monitoring the vessel strike avoidance zone for marine mammals and sea turtles. Visual observers may be PSO or Trained Lookouts (if PSOs are not required), but Trained Lookouts responsible for these duties must be provided sufficient training by the Lessee to distinguish marine mammals and sea turtles from other phenomena and must be able to identify a marine mammal as a NARW, other whale (defined in this context as sperm whales or baleen whales other than NARW), or other marine mammal, as well as sea turtles. Any crew designated as Trained Lookouts must also receive training on vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations must be recorded per reporting requirements.
		  ○ If the Trained Lookout is a vessel crew member, this must be their designated role and primary responsibility on shift. Crew members serving as visual observers must not have other duties while observing for marine mammals while the vessel is operating over 10 knots.
		• Vessel captains/ operators must reduce vessel speed to 10 knots (18.5 kilometers per hour) or less for the remainder of that day when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel when safety permits. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised.
		• Alternative monitoring technology (e.g., night vision, thermal cameras) must be available on all vessels to maintain a vigilant watch at night and in any other low-visibility conditions. All observations must be recorded per reporting requirements. The trained lookout must check the Sea Turtle Sighting Hotline (https://seaturtlesightings.org/) before each trip and report any detections of sea turtles in the vicinity of the planned transit to all vessel operators or captains and lookouts on duty that day.
		• Vessel captain and crew must maintain a vigilant watch for all protected species and reduce speed, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any listed species. If pinnipeds or small delphinids of Delphinus, Lagenorhynchus, Stenella, or Tursiops are visually detected approaching the vessel (i.e., to bow ride) or towed equipment, vessel speed reduction, course alteration, and shutdown are not required.
		• If a vessel is underway, a PSO must monitor a protected species separation distance of 100 m for sea turtles and 500 m or greater for marine mammals visible at the surface, to ensure detection of that animal in time to take necessary measures to avoid striking the animal. If the vessel does not require a PSO for the type of activity being conducted, crew may be used as a Trained Lookout to meet this requirement.
		• All vessel crew members must be briefed in the identification of protected species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of listed species. The expectation and process for reporting protected species sightings during surveys must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so. Vessel crew members must be provided with an Atlantic reference guide to help identify marine mammals and sea turtles that may be encountered. Vessel personnel must also be provided material regarding NARW SMAs, DMAs, visually triggered Slow Zones, sightings information, and reporting.
		• A minimum separation distance of 500 m from all ESA-listed whales (including unidentified large whales) must be maintained around all surface vessels at all times.
			Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• If a large whale is identified within 500 m of the forward path of any vessel, the vessel operator must steer a course away from the whale at 10 knots (18.5 km/hr) or less until the 500 m minimum separation distance has been established. Vessels may also shift to idle if feasible. • If a large whale is sighted within 200 m of the forward path of a vessel, the vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m. If stationary, the vessel must not engage engines until the large whale has moved beyond 500 m. • If a sea turtle or manta ray is sighted at any distance within the operating vessel's forward path, the vessel operator must slow down to 4 knots and steer away (unless unsafe to do so). The vessel may resume normal vessel operations once the vessel has passed the turtle or ray. • On vessels operating north of the Virginia/North Carolina border between June 1 and November 30, the Lessee must post a trained lookout on all vessel transits during all phases of the project to observe for sea turtles. The trained lookout must communicate any sightings, in real time, to the vessel operator so that the requirements can be implemented. • On vessels operating south of the Virginia/North Carolina border, the Lessee must post a trained lookout on all vessel transits during all phases of the project to observe for sea turtles. The trained lookout must communicate any sightings, in real time, to the vessel operator so that the requirements can be implemented. • The trained lookout must maintain a vigilant watch and monitor a Vessel Strike Avoidance Zone (500 m) at all times to avoid potential vessel strikes of ESA-listed sea turtle species. Alternative monitoring technology (e.g., night vision, thermal cameras, etc.) must be available and utilized by the lookout to ensure effective watch at night and in any other low visibility conditions. If the trained lookout is a vessel crew member, this must be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. • If a sea turtle is sighted within 100 m or less of the operating vessel's forward path, the vessel operator must slow down to 4 knots (unless unsafe to do so) and then proceed away from the turtle at a speed of 4 knots or less until there is a separation distance of at least 100 m at which time the vessel may resume normal operations. Vessel transits to and from the wind project area that require PSOs must maintain a speed that will allow, considering weather conditions, effective detection of sea turtles prior to reaching the 100 m avoidance measure. If a sea turtle is sighted within 50 m of the forward path of the operating vessel, the vessel operator must shift to neutral when safe to do so and then proceed away from the turtle at a speed of 4 knots. The vessel may resume normal operations once it has passed the turtle. • Vessel captains/ operators must avoid transiting through areas of visible jellyfish aggregations or floating Sargassum lines or mats. In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas. • Vessels operating in water depths with less than four feet of clearance between the vessel and the bottom should maintain speeds no greater than 4 kts to minimize risk of vessel strikes on sturgeon and sawfish. • All vessel crew members must be briefed in the identification of sea turtles and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of sea turtles. The expectation and process for reporting of sea turtles (including live, entangled, and dead individuals) must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so. • The only exception to the requirements regarding vessel speed and avoiding jellyfish, Sargassum, and/or sea turtles is when the safety of the vessel or crew during an emergency necessitates deviation from these requirements. If any such incidents occur, they must be reported to BSEE and NMFS GARFO-PRD within 24 hours. • If a vessel is carrying a PSO or trained lookout for the purposes of maintaining watch for NARWs, an additional lookout is not required and this PSO or trained lookout must maintain watch for whales and sea turtles. • Vessel transits to and from the project area that require PSOs must maintain a speed commensurate with weather conditions and effectively detecting sea turtles prior to reaching the 100 m separation distance mentioned above, at which point the vessel must reduce speed and avoid sea turtles. • Any observations of a marine mammal or ESA-listed species by crew members aboard any vessel associated with the project must be relayed to the PSO on duty and/or captain of the vessel. • Regardless of monitoring duties, all crew members responsible for navigation duties must receive site-specific training on ESA-listed species sighting/reporting and vessel strike avoidance measures. • Vessels underway must not divert their course to approach any ESA-listed species and marine mammals. • Regardless of vessel size, vessel operators must reduce vessel speed to 10 knots (18.5 kph) or less while operating in any Seasonal Management Area (SMA) and Dynamic Management Area (DMA) or Slow Zone for North Atlantic right whales, unless the vessel is operating in a designated DMA or Slow Zone where right whales have not been detected and it is not reasonable to expect the presence of North Atlantic right whales (e.g., Long Island Sound, shallow harbors). Information about active SMAs, DMAs, and Slow Zones can be accessed at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales. • Year-round, all vessel operators must monitor the project's Situational Awareness System, WhaleAlert, USCG VHF Channel 16, and the Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs once every 4-hour shift during project-related activities. The PSO and PAM operator monitoring teams for all activities must also monitor these systems no less frequently than every 12 hours. If a vessel operator is alerted to a NARW detection within the project area, the operator must immediately convey this information to the PSO and PAM teams. For any UXO/MEC detonation, vessel operators must monitor these systems for 24 hours prior to detonating any UXO/MEC.			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		The following measures, in addition to the PSO measures outlined in MUL-10d, also apply to all vessels associated with any survey activities (transiting or actively surveying): • For monitoring around ASVs controlled from a manned vessel, regardless of the equipment the vessel may be operating, a dual thermal/HD camera must be installed on the mother vessel facing forward and angled in a direction so as to provide a field of view ahead of the vessel and around the ASV. A dedicated operator must be able to monitor the real-time output of the camera on hand-held computer tablets. Images from the cameras must be able to be captured and reviewed to assist in verifying species identification. A monitor must also be installed in the bridge displaying the real-time images from the thermal/HD camera installed on the front of the ASV itself, providing a further forward view of the craft. In addition, night-vision goggles with thermal clip-ons and a handheld spotlight must be provided and used such that PSOs can focus observations in any direction around the mother vessel and/or the ASV. • Survey plans must include identification for vessel strike avoidance measures, including procedures for equipment shut down and retrieval, communication between PSOs/Trained Lookouts, equipment operators, and the captain, and other measures necessary to avoid vessel strikes while maintaining vessel and crew safety. If any circumstances are anticipated that may preclude the implementation of this measure, they must be clearly identified in the survey plan and alternative procedures outlined in the plan to ensure minimum distances are maintained and vessel strikes can be avoided. • To monitor the minimum separation distance, a PSO (or Trained Lookout if PSOs are not required) must be posted during all times a vessel is underway (transiting or surveying) to monitor for listed species within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard). • Visual observers monitoring the minimum separation distance can be either PSOs or Trained Lookouts (if PSOs are not required). If the Trained Lookout is a vessel crew member, this must be their designated role and primary responsibility on shift. Any crew designated as Trained Lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations must be recorded per reporting requirements.			
MUL-1	Marine debris awareness and elimination	“Marine trash and debris” is defined as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other solid, human-made item or material that is lost or discarded in the marine environment by the Lessee or an authorized representative of the Lessee (collectively, the “Lessee”) while conducting activities on the OCS in connection with a lease, grant, or approval issued by the BOEM or BSEE. To understand the type and amount of marine debris that may be generated, and to minimize the risk of entanglement in and/or ingestion of marine debris by protected species, the Lessee must implement the following: • Marine Debris Awareness Training and Certification: The Lessee must ensure that all vessel operators, employees, and contractors engaged in a project’s offshore activities complete marine trash and debris awareness training initially (i.e., prior to engaging in offshore activities pursuant to the approved COP) and annually. Operators must implement a marine debris awareness training and certification process that ensures that their employees and contractors are adequately trained. The training and certification process must include the following elements: (1) viewing of either a marine debris video or training slide pack posted on the BSEE website (https://www.bsee.gov/debris) or by contacting BSEE; (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements; and (3) documented certification that all personnel listed above have completed their initial and annual training. The Lessee must make this certification available for inspection by BSEE upon request. The marine trash and debris training videos, training slide packs, and other marine debris related educational material may be obtained at https://www.bsee.gov/debris or by contacting BSEE at marinedebris@bsee.gov. The training videos, slides, and related material may be downloaded directly from the website. • Training Compliance Report: By January 31 of each year, the Lessee must submit to BSEE an annual report that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year. • Marking: Any materials, equipment, tools, containers, and other items that are used in OCS activities and that are of such shape or configuration that make them likely to snag or damage fishing devices or be lost or discarded overboard, must be clearly marked with the vessel or facility identification number, and must be properly secured to prevent loss overboard. All markings must clearly identify the owner and must be able to resist the effects of the environmental conditions to which they may be exposed. • Recovery and Prevention: Discarding trash or debris in the marine environment is prohibited. Debris accidentally released by the Lessee into the marine environment while performing any activities associated with the project must be recovered within 24 hours when the marine debris is likely to (a) cause undue harm or damage to natural resources (e.g., entanglement or ingestion by protected species); or (b) interfere with OCS uses (e.g., snagging or damaging fishing equipment, or presenting a hazard to navigation). If the marine debris was lost within the boundaries of an archaeological resource/avoidance area, or a sensitive ecological/benthic resource area, the Lessee must contact BSEE for concurrence before conducting any recovery efforts. The Lessee must take steps to prevent similar releases of marine debris and must submit a description of these preventative actions to BSEE within 30 days from the date on which the release of marine debris occurred. • Notification: The Lessee must notify BSEE within 24 hours of any releases of marine debris and indicate whether the released marine debris was immediately recovered. If the marine debris was not recovered, the Lessee must provide its rationale for not recovering the marine debris (e.g., marine debris is located within the boundaries of a sensitive area, recovery was not possible because conditions were unsafe, or recovery was not practicable and warranted because the released marine debris is not likely to result in items (a) or (b) listed in above). • Remedial Recovery: After reviewing the notification and rationale for any decision by the Lessee to forgo recovery, BSEE may order the Lessee to recover the marine debris if BSEE finds that the reasons provided by the Lessee in the notification are insufficient and the marine debris would cause undue harm or damage to natural resources or interfere with OCS uses. • Recovery Plan: If BSEE requires the Lessee to recover the marine debris, the Lessee must submit a Recovery Plan to BSEE within 10 days after receiving BSEE’s order. Unless BSEE objects within 48 hours after the Recovery Plan has been accepted or is in review status by BSEE in TIMSWeb, the Lessee may proceed with the	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Water Quality; Sea Turtles	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		activities described in the Recovery Plan. Recovery activities must be completed 30 days from the date on which marine debris was released, unless BSEE grants the Lessee an extension. • Recovery Completion Notification: Within 30 days after the marine debris is recovered, the Lessee must provide notification to BSEE that recovery was completed and, if applicable, describe any substantial variance from the activities described in the Recovery Plan that was required during the recovery efforts. • Monthly Reporting: The Lessee must submit to BSEE a monthly report, no later than the fifth day of the month, of all marine debris lost or discarded during the preceding month, including, if applicable, information related to 24 Hour Reporting and Recovery Plan and the referenced TIMSWeb Submittal ID (SID). The Lessee is not required to submit a report for those months in which no marine debris was lost or discarded. The monthly report must include the following: a. Project identification and contact information for the Lessee and for any operators or contractors involved; b. Date and time of the incident; c. Lease number, OCS area and block, and coordinates of the object's location (latitude and longitude in decimal degrees); d. A detailed description of the dropped object to include dimensions (approximate length, width, height, and weight), composition (e.g., plastic, aluminum, steel, wood or paper), and buoyancy (floats or sinks); e. Pictures, data imagery, data streams, and/or a schematic or illustration of the object, if available; f. Indication of whether the lost or discarded item could be detected as a magnetic anomaly of greater than 50 nanotesla (nT), a seafloor target of greater than 1.6 feet (0.5 meter), or a sub-bottom anomaly of greater than 1.6 feet (0.5 meter) when operating a magnetometer or gradiometer, side scan sonar, or sub-bottom profiler; g. Explanation of how the object was lost; and h. Description of immediate recovery efforts and results, including photos. • Annual Surveying and Reporting – Periodic Underwater Surveys, Reporting of Monofilament and Other Fishing Gear Around WTG Foundations: The Lessee must monitor indirect impacts associated with charter and recreational fishing gear lost from expected increases in fishing around WTG foundations by annually surveying at least 10 of the WTGs in the lease area for the first three years following COP approval and every 5 years thereafter. The Lessee may conduct surveys by remotely operated vehicles, divers, or other means to determine the frequency and locations of marine debris. The Lessee must report the results of the surveys to BOEM and BSEE in an annual report, submitted by January 31, for the preceding calendar year. Annual reports must be submitted in both Microsoft Word and Adobe PDF format. Photographic and videographic materials (TIFF or Motion JPEG 2000) must be provided in TIMSWeb with the submittal of the annual report. Photographic and videographic files can also be submitted to marinedebris@bsee.gov if the files cannot be uploaded in TIMSWeb. Survey design and effort (i.e., the number of WTGs and frequency of reporting) may be modified only upon review and concurrence by BOEM and BSEE. a. Annual reports must include a summary of the survey reports that includes survey date(s); contact information of the operator; location and pile identification number; photographic and/or video documentation of the survey and debris encountered; any animals sighted; and the disposition of any located debris (i.e., removed or left in place). Annual reports must also include claim data attributable to the project from the Lessee's corporate gear loss compensation policy and procedures. Required data and reports may be archived, analyzed, published, and disseminated by BOEM and BSEE. • Site Clearance and Decommissioning: The Lessee must include and address information on unrecovered marine debris in the description of the site clearance activities provided in the decommissioning application required under 30 C.F.R. § 285.906.			
MUL-2	Anchoring plan	The Lessee must prepare and implement an Anchoring Plan(s) for all areas where anchoring or buoy placement occurs and jack-up barges are used during construction and operations/maintenance within 1,640 feet (500 meters) of habitats, resources, and submerged infrastructure that are sensitive, including sensitive benthic habitats; boulders greater than or equal to 0.5 m; ancient submerged landform features (ASLFs); known and potential shipwrecks; potentially significant debris fields; potential hazards; third-party infrastructure; and any related facility installation activities (such as cable, WTG, and ESP installation). The plan will require that the Lessee consider any new data on benthic habitats and cultural resources to avoid/minimize impacts on these resources to the maximum extent practicable. It will require all vessels deploying anchors to use, whenever feasible and safe, mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor. The Lessee must provide the anchoring plan to BOEM and BSEE to coordinate with NMFS for review before anchoring activities and construction begin. The Lessee must resolve all comments on the anchoring plan to BOEM and BSEE's satisfaction before conducting any OCS seabed-disturbing activities that require anchoring. For operations and decommissioning, the Lessee must provide proposed anchoring plats to BOEM and BSEE for review and concurrence before anchoring activities occur. The proposed anchoring plats must include avoidances identified above and as-placed anchor plats must be submitted to BOEM and BSEE after completion of an activity (including during operations) or construction of a major facility component (e.g., buoys, export cable installation, WTG or OSS installation and interarray cable installation) or decommissioning to demonstrate that seabed-disturbing activities complied with avoidance requirements for seabed features and hazards, archaeological resources, and/or anomalies. As-placed plats must show the "as-placed" location of all anchors and any associated anchor chains and/or wire ropes and relevant locations of interest or avoidance on the seabed for all seabed-disturbing activities. The plats must be at a scale of 1 inch = 1,000 feet (300 meters) with Differential GPS accuracy.	Benthic; Commercial and For-Hire Fishing; Cultural Resources; Finfish, Invertebrates, and EFH; Water Quality	BOEM, BSEE, and NMFS	Previously Applied
MUL-3	Berm survey and report	Where plows, jets, grapnel runs, or other similar methods are used, post-construction geophysical surveys required as part of the Post-Installation Cable Monitoring must be capable of detecting bathymetry changes of 0.5 meters or less and must be completed to determine the height and width of any created berms. The Lessee must capture bathymetry changes greater than 3 feet during the first and second post-installation surveys along the cable routes. If there are bathymetric changes in berm height greater than 1 meter above grade after the second survey, the Lessee must develop and implement a Berm Remediation Plan to restore created berms to match adjacent natural bathymetric contours (isobaths), as technically and/or economically practical or feasible. The Lessee must submit the Berm Remediation Plan to BOEM and BSEE for a review (in coordination with NMFS) within 90 days of completion of the post-construction survey where the change was detected. The Lessee	Benthic; Finfish, Invertebrates, and EFH	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		must resolve all comments on the Berm Remediation Plan to BOEM's and BSEE's satisfaction prior to initiating restoration activities. The final version of the Berm Remediation Plan must be provided to BOEM, BSEE, NMFS, and USACE.			
MUL-4	Final cable protection in hardbottom	The Lessee must avoid the use of engineered stone or concrete mattresses in complex habitat, as practicable and/or feasible. The Lessee must ensure that all materials used for scour and cable protection measures consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-dimensional complexity in height and in interstitial spaces, as practicable and feasible. If concrete mattresses are necessary, bioactive concrete (i.e., with bio-enhancing admixtures) must be used as practicable as the primary scour protection (e.g., concrete mattresses) or veneer to support biotic growth.	Benthic; Finfish, Invertebrates, and EFH	BOEM, BSEE, and NMFS	Previously Applied
MUL-8	Gear identification	To facilitate identification of gear on any entangled animals, all trap/pot gear used in the surveys must be uniquely marked to distinguish it from other commercial or recreational gear. Using yellow and black striped duct tape, place a 3-foot-long mark within 2 fathoms of a buoy. In addition, using black and white paint or duct tape, place three additional marks on the top, middle, and bottom of the line. These gear marking colors are proposed as they are not gear markings used in other fisheries and are therefore distinct. Any changes in marking would not be made without notification and approval from NMFS.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-9	Lost survey gear	The Lessee must ensure that any lost fishery and benthic monitoring survey gear is reported and recovered according to the Marine Debris Awareness and Elimination (MUL-1) measure. All lost gear must also be reported to NMFS GARFO-PRD and BSEE within 24 hours (or as required in the MMPA Incidental Take Authorization (ITA)) of the documented time when gear is discovered to be missing or lost. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-10a	Avoid live bottom features during data collection and site survey activities	All vessel anchoring and any seafloor-sampling activities are restricted from seafloor areas with deep/cold-water coral reefs and shallow/mesophotic reefs. All vessel anchoring and seafloor sampling must also occur at least 150 m from any known locations of threatened or endangered coral species. All sensitive live bottom habitats (eelgrass, cold-water corals, etc.) should be avoided as practicable. All vessels in coastal waters will operate in a manner to minimize propeller wash and seafloor disturbance and transiting vessels should follow deep-water routes (e.g., marked channels), as practicable, to reduce disturbance to sturgeon habitat.	Finfish, Invertebrates, and EFH; Benthic	BOEM, BSEE, and NMFS	Previously Applied
MUL-10d	Third-party PSO requirements during data collection and site survey activities	The Lessee must use qualified third-party PSOs to observe Clearance and Shutdown Zones, and implement mitigation measures as outlined in the conditions in MMST-12 and MMST-14. Additionally: • All PSOs must have completed a training program with BOEM-approved PSO training materials. PSOs must also have received NMFS approval to act as a PSO for geophysical surveys. Application requirements to become an NMFS-approved PSO for surveys are available by sending an inquiry to nmfs.psoreview@noaa.gov. The Lessee must provide to BOEM upon request, documentation of NMFS approval as PSOs for geophysical activities in the Atlantic and copies of the most recent training certificates of individual PSOs' successful completion of a commercial PSO training course with an overall examination score of 80% or greater. Instructions and application requirements to become a NMFS- approved PSO can be found at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/protected-species-observers. • For situations where Trained Lookouts are used when PSOs are not required, training must include protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. • PSOs deployed for mitigation, monitoring, and reporting of geophysical survey activities must be employed by a third-party observer provider. While the vessel is underway, they must have no other tasks other than to conduct observational effort, record data, communicate with and instruct relevant vessel crew to the presence of listed species and implement required mitigation and monitoring measures. PSOs on duty must be clearly listed on daily data logs for each shift. ○ Non-third-party observers may be approved by NMFS on a case-by-case basis for limited, specific duties in support of approved, third-party PSOs. • A minimum of one PSO must be on duty for observing listed species on each vessel at all times, including times with low visibility (e.g., night time, fog) that noise-producing equipment is operating, or the survey vessel is actively transiting. The Lessee must include a PSO schedule showing that the number of PSOs used is sufficient to effectively monitor the affected area for the project (e.g., surveys) and record the required data. PSOs must not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch. PSOs must not work for more than 12 hours in any 24-hour period. • Visual monitoring must occur from the most appropriate vantage point on the associated operational platform that allows for maximum possible 360-degree field of view around the sound source and vessel. If 360-degree field of view is not possible from a single vantage point, multiple PSOs must be on watch to ensure such coverage to ensure both geophysical survey and vessel strike avoidance requirements for ESA-listed species can be implemented. • The Lessee must ensure that suitable equipment is available to each PSO to adequately observe the full extent of the Clearance and Shutdown Zones prior to and during all geophysical survey activity respectively and meet all reporting requirements. The following equipment must be available. ○ Visual observations must be conducted using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner. ○ Rangefinders (at least one per PSO, plus backups) or reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups) to estimate distances to listed species located in proximity to the Clearance and Shutdown Zone(s). ○ Digital cameras with a telephoto lens that is at least 300 mm or equivalent on a full-frame single lens reflex (SLR). The camera or lens should also have an image stabilization system. Used to record sightings and verify species identification when possible. ○ A laptop or tablet to collect and record data electronically. ○ Global Positioning Units (GPS) if data collection/reporting software does not have built-in positioning functionality. ○ Any other tools deemed necessary to adequately perform PSO tasks.	Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
MUL-10e	PSO Reporting requirements during site characterization and site assessment/data collection activities	These reporting requirements pertain to site characterization (HRG, geotechnical, and biological surveys) and site assessment/data collection (deployment, operation, and retrieval of meteorological and oceanographic data buoys) activities associated with Atlantic OCS leases. To ensure compliance and evaluate effectiveness of mitigation measures, regular reporting of survey activities and information on listed species will be required as follows. Only vessel surveys which require third-party PSOs will be required to meet reporting requirements. Reporting requirements must be completed if applicable regardless of survey type or type of observer. PSO data must be collected in accordance with standard data reporting, software tools, and electronic data submission standards approved by BOEM and NMFS for the particular activity. • **Monthly Survey Reports.** Monthly reporting of raw PSO data collected during geophysical survey activities must be submitted to BOEM (renewable_reporting@boem.gov) and BSEE (via TIMS Web Portal and protectedspecies@bsee.gov) by the PSO provider on the 15th of each month for each vessel conducting survey work. Any editing, review, and quality assurance checks must be completed only by the PSO provider prior to submission to BOEM and ensure use of standard field codes and formats. Monthly data reporting from all PSO observations must be recorded based on standard PSO collection and reporting requirements. PSOs must use standardized electronic data forms to record data. The PSOs may record data electronically in data collection software, but the data fields listed below must be recorded and exported to an Excel file for submittal. Alternatively, BOEM has developed an Excel spreadsheet with all the necessary data fields that is available upon request. • **Final Survey Reports.** Final survey reports must be submitted to BOEM in coordination with PSO Providers within 90 calendar days following completion of a survey. Final reports must contain all survey activity included under each submitted survey plan, but include individual vessel departure and return ports, PSO names and training certifications, the PSO provider contact information, dates of the survey, a vessel track, a summary of all PSO documented sightings of protected species, survey equipment shutdowns that occurred, any vessel strike-avoidance measures taken, takes of protected species that occurred, and any observed injured or dead protected species. The DOI will work with the Lessee to ensure that DOI does not release confidential business information found in the monitoring reports. • **Instructions for Geophysical Survey Reports**. The following data fields for PSO reports of geophysical surveys must be reported in Excel format (.xml file) along with metadata defining all data fields. **Survey Information:** ○ Project name ○ Lease number ○ State Coastal Zones ○ Survey Contractor ○ Survey Type ○ Reporting start and end dates ○ Visual monitoring equipment used (e.g., bionics, magnification, IR cameras, etc.); ○ Distance finding method used ○ PSO names (last, first), training certification, and affiliation ○ PSO location and observation height above sea surface **Operations Information:** ○ Vessel name(s) ○ Sound sources including equipment type, power levels, and frequencies used ○ Greatest RMS source level ○ Dates of departures and returns to port with port name **Monitoring Effort Information:** ○ Date (YYYY-MM-DD) ○ Source status at time of observation (on/off) ○ Number of PSOs on duty ○ Start time of observations for each shift in UTC (YY-MM-DDT HH:MM) ○ End time of observations for each shift in UTC (YY-MM-DDT HH:MM) ○ Duration of visual observations of protected species ○ Weather ○ Wind speed (knots), direction (cardinal direction) ○ Beaufort Scale sea state ○ Water depth (meters) ○ Visibility (km) ○ Glare severity related to monitoring area (none, slight, moderate, extreme) ○ Time pre-clearance visual monitoring began in UTC (YY-MM-DDT HH:MM) ○ Time pre-clearance monitoring ended in UTC (YY-MM-DDT HH:MM)	Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ Duration of pre-clearance visual monitoring ○ Time of day of pre-clearance began (day/night) ○ Time power-up/ramp-up began ○ Time equipment full power was reached ○ Duration of power-up/ramp-up (if conducted) ○ Time survey activity began (equipment on) in UTC ○ Time survey activity ended (equipment off) in UTC ○ Survey Duration ○ Did a shutdown/power-down occur? • Time shutdown was called for (UTC) • Time equipment was shut down (UTC) ○ Vessel location (latitude/longitude, decimal degrees) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts; recorded at :30 intervals if obtainable from data collection software ○ Habitat or prey observations (narrative) ○ Marine debris sightings (narrative) **Detection Information (in addition to the Survey, Operation, and Monitoring fields)** ○ Date (YYYY-MM-DD) ○ Sighting ID (multiple sightings of the same animal or group should use the same ID) ○ Time at first detection in UTC (YY-MMDDT HH:MM) ○ Time at last detection in UTC (YY-MM-DDT HH:MM) ○ PSO name(s) (Last, First) on duty ○ Observer location ○ Number of observes on duty ○ Watch Status (On effort PSO, off effort PSO, opportunistic, crew, alternate vessel/platform) ○ Effort (ON=Device On; OFF=Device Off) ○ Start time of observations ○ End time of observations ○ Location of vessel when detection occurs: Latitude and Longitude (decimal degrees) ○ Compass heading of vessel (degrees) ○ Beaufort sea state ○ Wind speed (knots/direction) ○ Swell Height (meters) ○ Weather/Precipitation ○ Visibility (kilometers) ○ Cloud coverage (%) ○ Glare severity related to monitoring area (none, slight, moderate, extreme) ○ Species (Species Code) ○ Certainty of identification ○ Number of adults (high, low, best) ○ Number of juveniles (high, low, best) ○ Total number of animals or estimated group size ○ Sighting cue (Blow, Breach, White water, Flukes, Body) ○ Bearing to animal(s) when first detected (ship heading in degrees + clock face direction to animal) ○ Distance determination method (use code) ○ Distance from vessel (e.g., reticle distance in meters) ○ Description of unidentified animals (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) ○ Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) ○ Direction of travel/first approach (relative to vessel) ○ Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes)			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ If any bow-riding behavior observed, record total duration during detection (YY-MM-DDT HH:MM) ○ Initial heading of animal(s) (ship heading in degrees + clock face direction to animal) ○ Final heading of animal(s) (ship heading in degrees + clock face direction to animal) ○ Shutdown zone size during detection (meters) ○ Was the animal inside the shutdown zone? (Y/N) ○ Closest distance to vessel (reticle distance in meters) ○ Time at closest approach (UTC YY-MM-DDT HH:MM) ○ Time animal entered shutdown zone (UTC YY-MM-DDT HH:MM) ○ Time animal left shutdown zone (UTC YY-MM-DDT HH:MM) ○ If observed/detected during ramp-up/power-up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection ○ Did a shutdown/power-down occur? (Y/N) ○ Time shutdown was called for (UTC) ○ Time equipment was shut down (UTC)			
MUL-13	Protected Species Training for trawl and trap survey staff	The Lessee must ensure all vessels have at least one survey team member onboard each trawl survey and ventless trap survey who has completed Northeast Fisheries Observer Program training (within the last 5 years) or equivalent training (i.e., another training in protected species identification, safe handling, inclusive of taking genetic samples from Atlantic sturgeon). Reference materials for identification, disentanglement, safe handling, and genetic sampling procedures must be available on board each survey vessel. The Lessee must provide documentation of training to NMFS and BSEE at least 7 days prior to the start of the trawl surveys and at any later time that a different observer is deployed on the survey. If the Lessee will deploy non-NEFOP trained observers, the Lessee must submit a training plan to BSEE, BOEM and NMFS GARFO-PRD describing the training that will be provided to the survey observers. The Lessee must submit the PSO Training Plan for Trawl Surveys no later than 7 days prior to the start of trawl surveys. This plan must include a description of the elements of the training (i.e., curriculum, virtual or hands on, etc.) and identify who will carry out the training and their qualifications. Once the training is complete, confirmation of the training and a list of trained survey staff must be submitted to NMFS; this list must be updated if additional staff are trained for future surveys. The Lessee must submit a list of trained survey staff to NMFS GARFO-PRD at least one business day prior to the beginning of the survey. The Lessee must obtain BOEM and BSEE's concurrence with this plan before starting any trawl surveys.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-14a	UXO/MEC avoidance	The Lessee must develop and implement standard protocols for addressing unexploded ordnance (UXOs) risks, including implementation of best available technology to avoid or minimize exposure of protected species and sensitive habitats. Where *in situ* disposal is demonstrated to be necessary for the project, the Lessee must consult with state and federal agencies regarding seasonal restriction windows or other precautions. The Lessee must avoid, to the maximum extent practicable, interactions with UXO/Munitions and Explosives of Concern (MEC). If avoidance is not possible, submitted plans should follow all guidance (see Munitions and Explosives of Concern Survey Methodology and In-Field Testing for Wind Energy Areas on the Atlantic Outer Continental Shelf (pnnl.gov) at: https://tethys.pnnl.gov/sites/default/files/publications/Carton-et-al-2017-BOEM.pdf; Supporting National Environmental Policy Act Documentation for Offshore Wind Energy Development Related to Munitions and Explosives of Concern and Unexploded Ordinances (MEC-UXO White Paper [boem.gov]) at: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/MEC-UXO%20White%20Paper.pdf; or any other applicable regulation regarding interaction with UXO/MEC).	Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and USACE	Previously Applied
MUL-16	Post-storm event monitoring plan	The Lessee must provide a plan for post-storm event monitoring of the facility infrastructure, foundation scour protection, and cables to BSEE with the relevant FDR. The plan must describe how the Lessee will measure and monitor environmental conditions and duration of storm events; specify the environmental condition thresholds (and their associated technical justification) above which post-storm event monitoring or mitigation is necessary; describe potential monitoring, mitigation, and damage identification methods; and state when the Lessee must notify BSEE of post-storm event related activities. At a minimum, initial post-storm event inspections must be conducted for each OSS, met tower, and 10% of the WTGs including associated scour protection, following each storm where any condition(s) exceed one-half the design return period. For example, a WTG platform designed for 50-year environmental conditions must be inspected following a storm event that exceeds 25-year environmental conditions. Environmental condition thresholds are subject to change based on lessons learned during operations. To change the post-storm event inspection environmental condition threshold, the Lessee must submit a revised plan to BSEE for review and concurrence. BSEE reserves the right to require post-storm mitigations and additional inspections to address conditions that could result in safety risks and/or impacts on the environment.	Benthic; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM and BSEE	Previously Applied
MUL-19	Post-installation cable monitoring	The Lessee must conduct an inspection of each interarray, interconnector, and export cable to determine cable location, burial depths, the state of the cable, and site conditions within 6 months following installation of a cable segment. Additional inspections must be conducted within 1 year following completion of the initial post-construction inspection, and every 3 years thereafter until decommissioning. These surveys must also be conducted within 180 days of a storm event (as defined by the post-storm event monitoring plan, described in MUL-16). The Lessee must provide BSEE and BOEM with a cable monitoring report within 90 days following each inspection. Inspections of the interarray and export cables must include HRG methods, involving, for example, multibeam bathymetric survey equipment, and identify seabed features, natural and human-made hazards, and site conditions along federal sections of the cable routing. • If BSEE determines that conditions along the cable corridor warrant adjusting the frequency of inspections (e.g., due to changes in cable burial or seabed conditions that may impact cable stability or other users of the seabed), then BSEE may require the Lessee to submit a revised inspection schedule for review and concurrence.	Benthic; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• If BSEE determines that burial conditions have deteriorated or changed significantly and remedial actions are warranted, BSEE will notify the Lessee that the Lessee must submit the following via TIMS Web within 90 days of being notified: a seabed stability analysis, a remedial action plan, and a schedule for completing remedial actions. All remedial actions must be consistent with the approved COP. BSEE will review the plan and schedule and provide any comments within 60 days of receiving the plan. The Lessee must resolve all comments to BSEE's satisfaction. • If the Lessee determines that burial conditions have deteriorated or changed significantly and remedial actions are warranted, the Lessee must submit the following to BSEE via TIMS Web within 90 days of making the determination: the data used to make the determination, a seabed stability analysis, a plan for remedial actions, and a schedule for the proposed work. All remedial actions must be consistent with those described in the approved COP. BSEE will review the plan and schedule and provide comments within 60 days, if applicable. The Lessee must resolve all comments to BSEE's satisfaction.			
MUL-20	Soft start for impact pile driving	The Lessee must use a soft start protocol for impact pile driving of monopiles. Soft start must be used at the beginning of each day's monopile installation, and at any time following a cessation of impact pile driving of 30 minutes or longer. If a marine mammal or sea turtle is detected within or about to enter the applicable clearance zones, prior to the beginning of soft-start procedures, impact pile driving must be delayed until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings (i.e., 15 minutes for small odontocetes and 30 minutes for all other marine mammal species and sea turtles).	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-29	Sound Field Verification (SFV) Process, Plan and Reporting	The purpose of the Sound Field Verification (SFV) process is to document sound propagation from foundation installation to verify that the modeled acoustic fields are within expected ranges. The Lessee must perform "Thorough SFV" (defined as recording along a minimum of two radials with at least one radial containing recorders at three or more distances) on the first installation represented by each modeling scenario used. The Lessee must also perform Thorough SFV on the first three foundation installations of the project. The Lessee must also perform "Abbreviated SFV," placing a single recorder approximately 2460 feet (750 meters) from the foundation, on the installation of any foundations not requiring "thorough." If levels measured in any SFV (Thorough or Abbreviated) imply the exceedance of agency-identified ranges to regulatory thresholds, the Lessee must take mitigative actions in consultation with the federal permitting agencies. The Lessee must submit an SFV plan for review by BOEM, BSEE, NMFS, and USACE (when applicable). The Lessee must obtain written concurrence of the SFV plan from BOEM and BSEE before the planned commencement of field activities for pile driving. The plan must include measurement procedures and results reporting that meet ISO standard 18406:2017 (Underwater acoustics – Measurement of radiated underwater sound from percussive pile driving). See Chapter three of *BOEM Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans* for more information. The submission of raw acoustic data or data products associated with SFV to BOEM may be required. The Lessee must follow the approved plan. The SFV plan should include approximations of the expected variation of key parameters (e.g., difficulty to drive, predicted number of necessary strikes, foundation type, pile size, installation method, hammer energy rating, water depth, seabed composition, and season) across the project and an estimate of how many thorough monitoring locations will be required to cover this variability. The plan must describe how the Lessee selected the Thorough SFV locations, identifying which modeled scenarios match to which foundation locations and therefore to what ranges the results of those SFVs will be compared. The SFV process must be sufficient to assess sound propagation from the foundation and the distances to regulatory acoustic thresholds. The measurements must be compared to the modeled Level A and Level B harassment zones for marine mammals and the injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon. The plan must include a template of both Thorough and Abbreviated SFV interim reports. Thorough SFV interim reports must be submitted to BOEM, BSEE (TIMS), NMFS, and USACE (when applicable) within 48 hours of completion of foundation installation. Thorough SFV interim reports must include expected received level limits for future Abbreviated SFVs that are associated with the same modeled scenario and the Lessee must obtain BOEM and BSEE concurrence on these assumptions. Abbreviated SFV reports must also be submitted to BOEM, BSEE (TIMS), NMFS, and USACE (when applicable) but may be submitted in weekly batch reports as long as Abbreviated SFV measurements are at or below the received level limits defined in Thorough SFVs. The Lessee is referred to the BOEM *Nationwide Recommendations for Impact Pile-Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans* (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Nationwide%20Recommendations%20for%20Impact%20Pile%20Driving%20Sound%20Exposure%20Modeling%20and%20Sound%20Field%20Measurement.pdf) for other recommendations on what should be contained in the report. A final SFV Report must be submitted for review to agencies within 90 days of the cessation of foundation installation each calendar year. The Lessee must respond to requests for edits and updates in a timely manner.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-31	Fisheries Sampling gear removal between seasons	No wet storage of trap/pot gear is permitted. All trap/pot gear must be hauled at least once every 30 days, and all gear must be removed from the water and stored on land between survey seasons to minimize risk of entanglement.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM and BSEE	Previously Applied
MUL-32	Weekly, monthly, and final PSO reporting requirements (including foundation pile driving)	PSOs must collect data consistent with standard reporting forms, software tools, or electronic data forms authorized by BOEM for the particular activity. PSOs must fill out report forms for each vessel with PSOs aboard. Unfilled cells must be left empty and must not contain "NA." The reports must be submitted in Microsoft Word and Excel formats (not as a PDF). Enter all dates as YYYY-MM-DD. Enter all times in 24 Hour Coordinated Universal Time (UTC) as HH:MM. The PSO must create a new entry on the Effort form each time a pile segment changes, or weather conditions change, and at least once an hour as a minimum. The PSO must review and revise all forms for completeness and resolve incomplete data fields before submittal. The file name must follow this format: Lease#_ ProjectName_PSOData_YearMonthDay toYearMonthDay.xls. Data fields must be reported in Excel format. Data categories must include Project, Operations,	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		Monitoring Effort, and Detection, as further specified below. All PSO data must be generated through software applications or otherwise recorded electronically by PSOs and provided to BOEM and BSEE in electronic format (CSV files or similar format) and be checked for quality assurance and quality control. Applications developed to record PSO data are encouraged if the data fields listed below can be recorded and exported into Excel. Alternatively, BOEM has developed an Excel spreadsheet, with all the necessary data fields, that is available upon request. **Weekly Reports.** The Lessee must compile and submit weekly reports during construction that document pile driving, HRG survey, and detonation activities, including associated PSO, SFV, and noise abatement activities. These weekly reports must include any information required by a project's final NMFS BiOp and be submitted to NMFS GARFO-PRD, BOEM, and BSEE (protectedspecies@bsee.gov); they may be submitted directly from the PSO providers and may consist of raw data. Weekly reports must be submitted no later than Wednesday for the previous week (Sunday – Saturday). Weekly reports must include: • Summaries of pile-driving activities and piles installed, including pile ID, type of pile, pile diameter, start and finish time of each drilling and pile-driving event, hammer log (number of strikes, max hammer energy, duration of piling) per pile, any changes to noise attenuation systems and/or hammer schedule, details on the deployment of PSOs and PAM operators, including the start and stop time of associated observation periods by the PSOs and PAM Operators, and a record of all observations/detections of marine mammals and sea turtles as detailed below; • A summary of SFV and NAS implemented with pile driving. • Any UXO/MEC detonation activities, including a summary of SFV and NAS implemented during UXO/MEC detonation; • Which WTGs become operational and when (a map must be provided); • Summaries of HRG survey activities; • Vessel operations (including port departures and destinations, number of vessels, type of vessel(s), and route); • All protected species detections. This includes: species identification, number of animals, time at initial detection, time at final detection, distance to pile/vessel at initial detection, closest point of approach to pile/vessel, animal direction of travel relative to pile/vessel; description of animal behavior, features used to identify species, and for moving vessels: speed (knots), distance and bearing to animal at initial detection, closest point of approach and bearing to animal, distance and bearing to animal at final detection, and animal direction of travel relative to vessel. Sightings/detections during pile-driving activities (clearance, active pile driving, post-pile driving) and all other (transit, opportunistic, etc.) sightings/detection must be reported and identified as such; and • Vessel strike avoidance measures taken. **Monthly Reports**. Starting the first month that in-water activities occur on the OCS, the Lessee must compile and submit monthly reports that include a summary of all project activities carried out in the previous month, including dates and locations of any fisheries surveys, vessel transits (number of transits, name and type of vessel, ports used, and route inclusive of foreign and domestic ports), piles installed (number and ID), HRG surveys conducted, and UXO/MEC detonations, and all observations of ESA-listed whales, sea turtles, and sturgeon (i.e., MM-1, MUL-32, MUL-34, ST-2, MMST-1-2, STF-4 as applicable), inclusive of any mitigation measures taken as a result of those observations. Sightings/detections must include species ID, time, date, initial detection distance, vessel/platform name, vessel activity, vessel speed, bearing to animal, project activity, and if any, mitigation measures taken. These reports must include the information identified in the Project-specific NMFS BiOp, and the Lessee must submit the reports to BOEM, BSEE, and NMFS GARFO-PRD no later than the 15th of the month for the previous month. PSOs must collect data consistent with standard reporting forms, software tools, or electronic data forms authorized by BOEM for the particular activity. PSOs must fill out report forms for each vessel with PSOs aboard. Unfilled cells must be left empty and must not contain "NA." The reports must be submitted in Microsoft Word and Excel formats (not as a PDF). Enter all dates as YYYY-MM-DD. Enter all times in 24 Hour Coordinated Universal Time (UTC) as HH:MM. The PSO must create a new entry on the Effort form each time a pile segment changes, or weather conditions change, and at least once an hour as a minimum. The PSO must review and revise all forms for completeness and resolve incomplete data fields before submittal. The file name must follow this format: Lease#_ ProjectName_PSOData_YearMonthDay toYearMonthDay.xls. Data fields must be reported in Excel format. Data categories must include Project, Operations, Monitoring Effort, and Detection, as further specified below. All PSO data must be generated through software applications or otherwise recorded electronically by PSOs and provided to BOEM and BSEE in electronic format (CSV files or similar format) and be checked for quality assurance and quality control. Applications developed to record PSO data are encouraged if the data fields listed below can be recorded and exported into Excel. Alternatively, BOEM has developed an Excel spreadsheet, with all the necessary data fields, that is available upon request. Required data fields include: • Project Information: ○ Project name ○ Lease number ○ State coastal zones ○ PSO contractors ○ Vessel names ○ Reporting dates (YYYY-MM-DD) ○ Visual monitoring equipment used (e.g., bionics, magnification, IR cameras) ○ Distance finding method used ○ PSO names (Last, First) and training ○ Observation height above sea surface • Operations Information:			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ Date (YYYY-MM-DD) ○ Hammer type used (make and model) ○ Greatest hammer power used for each pile ○ Pile identifier and pile number for the day (e.g., pile 2 of 3 for the day) ○ Pile diameters ○ Pile length ○ Pile locations (latitude and longitude) ○ Number of vessel transits ○ Types of vessels used ○ Vessel routes used • Monitoring Effort Information: ○ Date (YYYY-MM-DD) ○ Noise source (ON=Hammer On; OFF=Hammer Off) ○ PSO name(s) (Last, First) ○ If visual, how many PSOs on watch at one time? ○ Time pre-clearance visual monitoring began in UTC (HH:MM) ○ Time pre-clearance monitoring ended in UTC (HH:MM) ○ Time pre-clearance PAM monitoring began in UTC (HH:MM) ○ Time PAM monitoring ended in UTC (HH:MM) ○ Duration of pre-clearance PAM and visual monitoring ○ Time power-up or ramp-up began in UTC (HH:MM) ○ Time equipment full power was reached in UTC (HH:MM) ○ Duration of power-up or ramp-up ○ Time pile driving began (hammer on) in UTC (HH:MM) ○ Time pile driving activity ended (hammer off) in UTC (HH:MM) ○ Duration of activity ○ Duration of visual detection ○ Wind speed (kts), from direction • Swell height (m): ○ Water depth (m) ○ Visibility (kilometers) ○ Glare severity ○ Latitude (decimal degrees), longitude (decimal degrees) ○ Compass heading of vessel (degrees) ○ Beaufort scale ○ Precipitation ○ Cloud coverage (%) ○ Did a shutdown/power-down occur? ○ Time shutdown was called for (UTC) ○ Time equipment was shut down (UTC) ○ Habitat or prey observations ○ Marine debris sighted • Detection Information: ○ Date (YYYY-MM-DD) ○ Sighting ID (V01, V02, or sequential sighting number for that day; multiple sightings of the same animal or group must use the same ID) ○ Date and time at first detection in UTC (YY-MM- DDT HH:MM) ○ Time at last detection in UTC (YY-MM-DDT HH:MM) ○ PSO name(s) (Last, First) ○ Effort (ON=Hammer On; OFF=Hammer Off) ○ If visual, how many PSOs on watch at one time?			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ Start time of observations ○ End time of observations ○ Duration of visual observation ○ Wind speed (kts), from direction ○ Swell height (m) ○ Water depth (m) ○ Visibility (kilometers) ○ Glare severity ○ Latitude (decimal degrees), longitude (decimal degrees) ○ Compass heading of vessel (degrees) ○ Beaufort scale ○ Precipitation ○ Cloud coverage (%) ○ Sightings including common name, scientific name, or family ○ Percent certainty of identification ○ Number of adults ○ Number of juveniles ○ Total number of animals ○ Bearing to animals when first detected (ship heading + clock face) ○ Bearing to animals at closest approach (ship heading+ clock face) ○ Bearing to animal at final detection (ship heading+ clock face) ○ Range from vessel and pile (reticle distance in meters) ○ Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) ○ Detection narrative (note behavior, especially changes in relation to activity and distance from service vessel) ○ Direction of animal travel in first approach relative to vessel and pile ○ Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes) ○ If any bow-riding behavior observed, record total duration during detection (UTC HH:MM) ○ Initial heading of animals (degrees) ○ Final heading of animals (degrees) ○ Shutdown zone size during detection (m) ○ Was the animal inside the shutdown zone? ○ Closest distance to vessel and pile (reticle distance in m) ○ Time at closest approach to vessel and pile (UTC HH:MM) ○ Time animal entered shutdown zone (UTC HH:MM) ○ Time animal left shutdown zone (UTC HH:MM) ○ If observed or detected during ramp-up or power-up: first distance (reticle distance in m), closest distance (reticle distance in m), last distance (reticle distance in m), behavior at final detection ○ Did a shutdown/power-down occur? ○ Time shutdown was called for (UTC HH:MM) ○ Time equipment was shut down (UTC HH:MM) ○ Detections with PAM **Annual Reports**. Beginning one calendar year after the completion of commissioning activities, the Lessee must compile and submit annual reports that include a summary of all project activities carried out in the previous year, including vessel transits (number, type of vessel, ports used, and route), repair and maintenance activities, survey activity, and all observations of ESA-listed species. The annual reports must be submitted to BOEM, BSEE, USACE, and NMFS GARFO. The Lessee must submit these reports by April 1 of each year for the previous calendar year (i.e., the 2026 report is due by April 1, 2027). Upon mutual agreement of NMFS GARFO, BOEM, and BSEE, the frequency of reports can be changed.			
MUL-33	Vessel communication of threatened and endangered species sightings and detections	The Lessee must ensure that whenever multiple project vessels are operating, any detections of ESA-listed species (marine mammals and sea turtles) are communicated in near real time to these personnel on the other project vessels: PSOs, vessel operators, or both. Year-round, all vessel operators must monitor the project's Situational Awareness System, WhaleAlert, USCG VHF Channel 16, and the Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs once every 4-hour shift during project-related activities. The PSO and PAM operator monitoring teams for all activities must also monitor these systems no less frequently	Finfish, Invertebrates, and EFH; Marine	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		than every 12 hours. If a vessel operator is alerted to a NARW detection within the project area, the operator must immediately convey this information to the PSO and PAM teams. For any UXO/MEC detonation, vessel operators must monitor these systems for 24 hours prior to detonating any UXO/MEC. Any observations of any large whale by any of the Lessee's staff or contractor, including vessel crew, must be communicated immediately to PSOs and all vessel operators to increase situational awareness.	Mammals; Sea Turtles		
MUL-34	Detected or impacted protected species reporting	The Lessee must report as soon as feasible but no later than 24 hours all observations of injured or dead whales, sea turtles, or sturgeon to BSEE and NMFS GARFO-PRD, including observations and interactions during the fisheries surveys (see STF-4 for additional details on take notification for sea turtles/Atlantic sturgeon during survey activities). The Lessee must ensure its reports reference the project and include the Take Report Form available on NMFS' webpage at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic. The Lessee must ensure reports of Atlantic sturgeon take include a statement as to whether a fin clip sample for genetic sampling was taken. Fin clip samples are required in all cases with the only exception being when additional handling of the sturgeon may result in an imminent risk of injury to the fish or the PSO. Incidents falling within the exception are expected to be limited to capture and handling of sturgeon in extreme weather. Instructions for fin clips and associated metadata are available at https://www.fisheries.noaa.gov/new-england-midatlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic under the "Sturgeon Genetics Sampling" heading. The Lessee must report any suspected or confirmed vessel strike of a sea turtle or sturgeon by any project vessel in any location, including observation of any injured sea turtle/sturgeon or sea turtle/sturgeon parts to BOEM, BSEE, NMFS GARFO-PRD, and to appropriate NOAA stranding hotline (for marine mammals between Maine-Virginia, report to 866-755-6622, and from North Carolina-Florida to 877-942-5343 and for sea turtles from Maine-Virginia, report to 866-755-6622, and from North Carolina-Florida to 844-732-8785) as soon as feasible. The Lessee must include in the report the following information: (a) time, date, and location (latitude/longitude) of the incident; (b) species identification (if known) or description of the animal(s) involved; (c) vessel's speed during and leading up to the incident; (d) vessel's course/heading and what operations were being conducted (if applicable); (e) status of all sound sources in use; (f) description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike; (g) environmental conditions (e.g., wind speed and direction, Beaufort scale, cloud cover, visibility) immediately preceding the strike; (h) estimated size and length of animal that was struck; (i) description of the behavior of the animal immediately preceding and following the strike; (j) estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and (k) to the extent practicable, photographs or video footage of the animal(s). In the event that an injured or dead marine mammal or sea turtle is sighted, the Lessee must report the incident to BOEM, BSEE, NMFS GARFO-PRD, and the appropriate hotline (options above), as soon as feasible, but no later than 24 hours from the sighting. The Lessee must include in the report the following information: (a) time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); (b) species identification (if known) or description of the animal(s) involved; (c) condition of the animal(s) (including carcass condition if the animal is dead); (d) observed behaviors of the animal(s), if alive; (e) if available, photographs or video footage of the animal(s); and (f) general circumstances under which the animal was discovered. The Lessee must follow any instructions provided by staff responding to the hotline call for handling or disposing of any injured or dead animals, which may include coordination of transport to shore, particularly for injured sea turtles. **UXO Detonation Reports**. The Lessee must compile and submit reports following any UXO/MEC detonation that provide details on the UXO/MEC that was detonated (e.g., charge size), location of the detonation, the start and stop of associated observation periods by the PSOs and PAM operators, details on the deployment of PSOs and PAM operators, and a record of all observations of marine mammals and sea turtles including time (UTC) of sighting/detection, species ID, behavior, distance (m) from vessel to animal at time of sighting/detection, vessel activity, platform/vessel name, and mitigation measures taken (if any). These reports must include any observations of dead or injured fish or other marine life in the post detonation monitoring period. The Lessee must ensure that the PSO providers submit these reports directly to NMFS GARFO-PRD, BSEE, and BOEM within one week of the detonation. The reports may consist of raw data that has undergone initial QA/QC review, or the raw data must be made available upon request. The Lessee must also ensure that the PSO providers submit all reports of dead or injured ESA listed species directly to NMFS GARFO-PRD, BSEE, and BOEM immediately, but no later than 24 hours following the observation. **Detected or Impacted Dead Non-ESA-Listed Fish**. The Lessee must report any occurrence of at least 10 dead non-ESA-listed fish within established shutdown or monitoring zones to BOEM and to BSEE (via email to protectedspecies@bsee.gov) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting. BOEM or BSEE will notify NMFS GARFO-HESD. The Lessee must confirm the relevant point of contact prior to reporting and confirm the reporting was received. **Protected Species Incident Reporting**. Regardless of activity/survey type or the need to provide a dedicated trained watch stander or PSO, any potential take, strikes, or dead/injured protected species caused by project activities must be reported to the NMFS GARFO Protected Resources Division nmfs.gar.incidental-take@noaa.gov), NOAA Fisheries 24-hour Stranding Hotline – for marine mammals from Maine-Virginia, report to (866) 755-6622, and from North Carolina-Florida to (877) 942-5343 and for sea turtles from Maine-Virginia, report to (866) 755-6622, and from North Carolina-Florida to (844)732-8785, BOEM (at mailto: renewable_reporting@boem.gov), and BSEE (at mailto: protectedspecies@bsee.gov) as soon as practicable, but no later than 24 hours from the time the incident took place (Protected Species Incident Report). The Protected Species Incident Report must include the following information: • Contact info for the person providing the report; • Time, date, and location (latitude/longitude) of the incident; • Species identification (if known) or description of the animal(s) involved; • Condition of the animal(s) (e.g., live, injured, dead); • Observed behaviors of the animal(s), if alive; • If available, photographs or video footage of the animal(s); and	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• General circumstances (e.g. vessel speed/direction of travel, sound sources in use) under which the animal was impacted. **Dead or Injured Protected Species Reporting**. All dead or injured protected species must be reported, regardless of whether they were observed during operations or directly due to Lessee activities. In the event that an injured or dead marine mammal or sea turtle is sighted, regardless of the cause, the Lessee must report the incident to the NMFS Protected Resources Division (nmfs.gar.incidental-take@noaa.gov), NMFS 24-hour Stranding Hotline number (866-755-6622), BOEM (at renewable_reporting@boem.gov), and BSEE (at protectedspecies@bsee.gov) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours from the sighting (Dead or Injured Protected Species Report). Staff responding to the hotline call will provide any instructions for the handling or disposing of any injured or dead protected species by individuals authorized to collect, possess, and transport sea turtles. The Protected Species Incident Report must include the following information: • Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); • Species identification (if known) or description of the animal(s) involved; • Condition of the animal(s) (including carcass condition if the animal is dead); • Observed behaviors of the animal(s), if alive; • If available, photographs or video footage of the animal(s); and • General circumstances under which the animal was discovered.			
MUL-37	Aircraft Detection Lighting System (ADLS)	The Lessee must use an FAA-approved vendor for the ADLS, which will activate the FAA hazard lighting only when an aircraft is in the vicinity of the wind facility to reduce visual impacts at night. The Lessee must confirm the use of an FAA-approved vendor for ADLS on WTGs and OSSs in the FIR.	Birds; Cultural Resources; Marine Mammals; Recreation and Tourism; Sea Turtles; Scenic and Visual Resources	BOEM, BSEE, and FAA	Previously Applied
MUL-40 (Previously NAV-1)	Boulder relocation reporting	The Lessee must provide USCG and NOAA with a comprehensive list and shapefile of positions and areas to which boulders >6.6 feet (>2 meters) will be relocated (latitude, longitude) at least 60 days prior to boulder relocation activities.	Commercial and For-Hire Fishing; Navigation and Vessel Traffic	BOEM, BSEE, USCG, and NOAA	Previously Applied

OU-1	Mitigation for oceanographic high frequency radars	The Lessee must coordinate with the radar operators and the Surface Currents Program of NOAA Integrated Ocean Observing System (IOOS) Office to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case, the Lessee must notify BOEM and engage radar operators and NOAA IOOS on mitigation efforts. The following options to mitigate operational impacts on oceanographic high-frequency radars have been identified:
		• Data sharing from turbine operators to include the following:
		  ○ Sharing real-time telemetry of surface currents and other oceanographic data measured at locations in the project with radar operators and into the public domain.
		  ○ Sharing time-series of blade rotation rates, nacelle bearing angles, and other information about the operational state of each of the project's turbines with radar operators to aid interference mitigation.
		• Wind turbine curtailment/curtailment agreement between NOAA IOOS, Lessee and BOEM
		Additional modifications identified for oceanographic high-frequency radar systems to mitigate impacts:
		• Signal processing enhancements.
		• Antenna modifications
		If the Lessee's project causes radar interference to the degree that radar performance is no longer within the specific radar systems' operational parameters or fails to meet NOAA IOOS's mission objectives, at least 120 calendar days prior to commissioning the first WTG or the start of blades spinning, whichever is earlier, the Lessee must enter into a mitigation agreement with the Surface Currents Program of NOAA's Integrated Ocean Observing System (IOOS) Office. Within 15 calendar days of entering into the mitigation agreement, the Lessee must provide BOEM with a copy of the executed mitigation agreement. Within 45 calendar days of completing any requirements in the mitigation agreement, the Lessee must provide BOEM and BSEE with evidence of compliance with those requirements.
			Other Uses	BOEM and BSEE	Previously Applied

OU-3	Mitigation for ARSR-4 and ASR-8/9 radars	The Lessee must coordinate with ARSR-4 and ASR-8/9 radar operators, including the FAA and DoD Clearinghouse, to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case, the Lessee must notify BOEM and engage radar operators on mitigation efforts. Operational mitigations identified for impacts on airport surveillance radar (ASR)-8/9 include: • Passive aircraft tracking using ADS-B or signal/transponder • Increased aircraft altitude near radar • Sensitivity time control (range-dependent attenuation) • Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates) • Track initiation inhibiting, velocity editing, plot amplitude thresholding (limiting the amplitude of certain signals) Modification mitigations for ARSR-4 and for ASR-8/9 systems include:	Other Uses	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• Utilizing the dual beams of the radar simultaneously • In-fill radars			
OU-7	Federal Survey Mitigation Program	There are NMFS scientific surveys that overlap with wind energy development in the northeast region. Consistent with NMFS and BOEM survey mitigation strategy actions 1.3.1, 1.3.2, 2.1.1, and 2.1.2 in the NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy – Northeast US Region (Hare et al. 2022),[3] within 120 days of COP approval, the Lessee must submit to BOEM a survey mitigation agreement between NMFS and the Lessee. The survey mitigation agreement must describe how the Lessee will mitigate the project impacts on the NMFS surveys. The Lessee must conduct activities in accordance with such agreement. If the Lessee and NMFS fail to reach a survey mitigation agreement, then the Lessee must submit a survey mitigation plan to BOEM and NMFS that is consistent with the procedures described below, within 180 days of COP approval. BOEM will review the survey mitigation plan in consultation with NMFS Northeast Fisheries Science Center (NEFSC), and the Lessee must resolve comments to BOEM's satisfaction and must conduct activities in accordance with the plan. • As soon as reasonably practicable, but no later than 30 days after the issuance of the project's COP approval, the Lessee must initiate coordination with NMFS NEFSC to develop the survey mitigation agreement. • Mitigation activities specified under the agreement must be designed to mitigate the project impacts on the NMFS NEFSC surveys that overlap with the project. At a minimum, the survey mitigation agreement must describe actions and the means to address impacts on the affected surveys due to the preclusion of sampling platforms and impacts on statistical designs. NMFS has determined that the project area is a discrete stratum for surveys that use a random stratified design. This agreement may also consider other anticipated project impacts on NMFS surveys, such as changes in habitat and increased operational costs due to loss of sampling efficiencies. • The survey mitigation agreement must identify activities that will result in the generation of data equivalent to data generated by NMFS' affected surveys for the duration of the project. The survey mitigation agreement must describe the implementation procedures by which the Lessee will work with NEFSC to generate, share, and manage the data required by NEFSC for each of the surveys impacted by the project, as mutually agreed upon between the Lessee and NMFS/NEFSC. The survey mitigation agreement must also describe the Lessee's participation in the NMFS NEFSC Northeast Survey Mitigation Program to support activities that address regional-level impacts for the surveys.	Other Uses	BOEM and NMFS	Previously Applied
ST-3	Sea turtle disentanglement	The Lessee must ensure all vessels deploying fixed gear (e.g., pots/traps) have adequate disentanglement equipment (i.e., knife and boathook) onboard. Any disentanglement will occur consistent with the Northeast Atlantic Coast STDN Disentanglement Guidelines (https://www.reginfo.gov/public/do/DownloadDocument?objectID=102486501) and the procedures described in Careful Release Protocols for Sea Turtle Release with Minimal Injury (NOAA Technical Memorandum 580; https://repository.library.noaa.gov/view/noaa/3773).	Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
STF-2	Sea turtle/Atlantic sturgeon identification, handling, and resuscitation guidelines	The Lessee must ensure any live, uninjured animals are returned to the water as quickly as possible after completing the required handling and documentation. Live and responsive sea turtles or Atlantic sturgeon incidentally caught and retrieved in gear used in any fisheries survey must be released according to established protocols and whenever at-sea conditions are safe for those releasing the animal(s). Any unresponsive sea turtles or Atlantic sturgeon caught and retrieved in gear used in fisheries surveys must be handled and resuscitated according to established protocols and whenever at-sea conditions are safe for those handling and resuscitating the animal(s). a. To the extent allowed by sea conditions, the Lessee must give priority to the handling and resuscitation of any sea turtles or sturgeon that are captured in the gear being used, if conditions at sea are safe to do so. Handling times for these species must be minimized (i.e., kept to 15 minutes or less) to limit the amount of stress placed on the animals. b. All survey vessels must be equipped with copies of the sea turtle handling and resuscitation requirements found at 50 C.F.R. § 223.206(d)(1) prior to the commencement of any on-water activity (https://media.fisheries.noaa.gov/dam-migration/sea_turtle_handling_and_resuscitation_measures.pdf). These handling and resuscitation procedures (the latter, when necessary) must be executed any time a sea turtle is incidentally captured and brought onboard a survey vessel. c. For sea turtles that appear injured, sick, distressed, or dead (including stranded or entangled individuals), survey staff must immediately contact the Greater Atlantic Region Marine Animal Hotline at 866-755-6622 for further instructions and guidance on handling, retention, potential coordination of transfer to a rehabilitation facility, and/or disposal of the animal. If survey staff are unable to contact the hotline (e.g., due to distance from shore or lack of ability to communicate via phone), then survey staff must contact the USCG via very high frequency (VHF) marine radio on Channel 16. If required, hard-shelled sea turtles (i.e., non-leatherbacks) may be held on board for up to 24 hours, provided conditions during holding are authorized by the NMFS GARFO-PRD-PRD and safe handling practices are followed. If the hotline or an available veterinarian cannot be contacted and the injured animal cannot be taken to a rehabilitation center, activities that could further stress the animal must be stopped. When sea-to-shore contact with the hotline or an available veterinarian is not possible, the animal must be allowed to recover and be responsive before safely releasing it to the sea. d. The Lessee must make attempts to resuscitate any Atlantic sturgeon that are unresponsive or comatose by providing a running source of water over the gills as described in the Sturgeon Resuscitation Guidelines (https://media.fisheries.noaa.gov/dam-migration-miss/Resuscitation-Cards-120513.pdf). The Lessee shall comply with the version effective at the time of COP approval. e. Carcasses of incidentally caught sea turtles and sturgeon must be held in cold storage (frozen is preferred, although refrigerated is permitted if a freezer is not available) until retention or disposal procedures are authorized by the NMFS GARFO-PRD, which may include transfer to an appropriately permitted partner or	Finfish, Invertebrates, and EFH; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

[3] Hare, J.A., Blythe, B.J., Ford, K.H., Godfrey-McKee, S., Hooker, B.R., Jensen, B.M., Lipsky, A., Nachman, C., Pfeiffer, L., Rasser, M. and Renshaw, K., 2022. NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy - Northeast US Region. NOAA Technical Memorandum 292. Woods Hole, MA. 33 pp.

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		facility on shore. Following reporting of an incidental capture, NMFS may authorize that incidentally captured dead sea turtles or Atlantic sturgeon be retained on board the survey vessel, provided that appropriate cold storage facilities are available on the survey vessel.			
STF-4	Take notification for sea turtles/Atlantic sturgeon during survey activities	The Lessee must notify BOEM, BSEE, and NMFS GARFO-PRD via email within 24 hours of any interaction with a sea turtle or sturgeon and include the NMFS take reporting form (https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic). The report must include, at a minimum, the following: (1) survey name and applicable information (e.g., vessel name, station number); (2) Global Positioning System (GPS) coordinates describing the location of the interaction (in decimal degrees); (3) gear type involved (e.g., bottom trawl, gillnet, longline); (4) soak time, gear configuration and any other pertinent gear information; (5) time and date of the interaction; (6) identification of the animal to the species level (if possible); and (7) a photograph or video of the animal (multiple photographs are suggested, including at least one photograph of the head scutes). If reporting within 24 hours is not possible (e.g., due to distance from shore or lack of ability to communicate via phone, fax, or email), the Lessee must submit reports as soon as possible and must submit late reports with an explanation for the delay. The Lessee must submit an annual report within 90 days of the completion of each survey season to BOEM, BSEE, and NMFS GARFO-PRD. The report must include all information on any observations of and interactions with ESA-listed species and contain information on all survey activities that took place during the season, including location of gear set, duration of soak, and total effort. The report on survey activities must be comprehensive of all activities, regardless of whether ESA-listed species were observed.	Finfish, Invertebrates, and EFH; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
WQ-1	Avoid zinc anodes	To the extent it is technically and/or economically practicable or feasible, the Lessee must avoid using zinc sacrificial anodes on external components of WTG and OSS foundations to reduce the release of metal contaminants in the water column.	Water Quality	BOEM and BSEE	Previously Applied
WQ-2	Oil Spill Response Plan	In compliance with 33 U.S.C. 1321, and including information identified in 30 CFR part 254 that is applicable to Lessee activities, the Lessee must submit an Oil Spill Response Plan (OSRP) to the BSEE Oil Spill Preparedness Division (OSPD) at BSEEOSPD_ATL_OSRPs@bsee.gov for review and approval prior to the installation of any component that may handle or store oil on the OCS. The OSRP may be lease-specific, or it may be a regional OSRP covering multiple leases. Facilities and leases covered in a regional OSRP must have the same owner or operator (including affiliates) and must be located in the Atlantic OCS region. For a regional OSRP, subject to BSEE OSPD approval, the Lessee may group leases into sub-regions for the purposes of determining worst-case discharge (WCD) scenarios, conducting stochastic trajectory analyses, and identifying response resources. The Lessee's OSRP must be consistent with the National Contingency Plan, Regional Contingency Plan, and the appropriate Area Contingency Plan(s), as defined in 30 CFR 254.6. To continue operating, the Lessee must operate consistently with the OSRP approved by BSEE. The Lessee's OSRP, including any regional OSRP, must contain the following information: 1. Bookmarks. Appropriately labeled bookmarks that are linked to their corresponding sections of the OSRP. 2. Table of Contents. 3. Record of Change. A table identifying the changes made to the current version of the OSRP and, as applicable, a record of changes made to previously submitted versions of the OSRP. 4. Facility and Oil Information. "Facility," as defined in 30 CFR 585.113, means an installation that is permanently or temporarily attached to the seabed of the OCS. An OSS and WTG, as examples, each meet this definition of facility. "Oil," as defined in 33 U.S.C. 1321(a), means oils of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. Dielectric fluid, as an example, meets this definition of oil. The OSRP must: a. List the latitude and longitude, water depth, and distance to the nearest shoreline for each facility that may handle and/or store oil. b. List the oil(s) by product/brand name and corresponding volume(s) on each type of facility covered under the Lessee's OSRP. c. Include a map depicting the location of each facility that may handle and/or store oil within the boundaries of the covered lease area(s) and their proximity to the nearest shoreline. The map must also feature a compass rose, scale, and legend. 5. Safety Data Sheets. The OSRP must include a safety data sheet for every type of oil present on any OCS facility in quantities equal to or greater than 100 gallons. 6. Response Organization. The OSRP must identify a trained Qualified Individual (QI), and at least one alternate, with full authority to implement removal actions and ensure immediate notification of appropriate federal officials and response personnel. The Lessee must designate personnel to serve as trained members of an Incident Management Team (IMT) and identify them by name and Incident Command System (ICS) position in the OSRP. a. "Qualified Individual" (QI) means an English-speaking representative of the Lessee who is located in the United States, available on a 24-hour basis, and given full authority to obligate funds, carry out removal actions, and communicate with the appropriate federal officials and the persons providing personnel and equipment in removal operations. b. "Incident Management Team" (IMT) means the group of personnel identified within the Lessee's organizational structure who manage the overall response to an incident in accordance with the Lessee's OSRP. The IMT consists of the Incident Commander (IC), Command and General Staff, and other personnel assigned to key ICS positions designated in the Lessee's OSRP. With respect to the IMT, the Lessee must identify at least one alternate in the OSRP for the IC, Planning Section Chief (PSC), Operations Section Chief (OSC), Logistics Section Chief (LSC), and Finance Section Chief (FSC). If a contract has been established with a third-party IMT, the Lessee must provide evidence of such a contract in the Lessee's OSRP. 7. Notification Procedures. The OSRP must describe the procedures for spill notification. Notification procedures must include the 24-hour contact information for: a. The QI and an alternate, including phone numbers and email addresses. b. IMT members, including phone numbers and email addresses. c. Federal, state, and local regulatory agencies that must be notified when a spill occurs, including, but not limited to, the National Response Center.	Water Quality	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		d. The Oil Spill Removal Organizations (OSRO) and Spill Response Operating Teams (SROT) that are available to respond. e. Other response organizations and subject matter experts that the Lessee will rely on for the Lessee's response. 8. Spill Mitigation Procedures. The OSRP must describe the different discharge scenarios that could occur from the Lessee's facilities and the mitigation procedures that the offshore facility operator and any listed/contracted OSROs would follow when responding to such discharges. The mitigation procedures must address responding to both smaller spills (with slow, low-volume leakage) and larger spills, to include the largest WCD scenario covered under the Lessee's OSRP. To achieve compliance with this section, the OSRP must include the following: a. Procedures for the early detection of a spill (i.e., monitoring procedures for detecting dielectric fluid and other oil-based substances handled or stored on the facility when spilled to the ocean). b. General procedures for ensuring that the source of a discharge is controlled as soon as possible after a spill occurs. c. Procedures to remove oil and oiled debris from shallow waters and along shorelines. d. Procedures to store, transfer, and dispose of recovered oil and oil-contaminated materials and to ensure that all disposal is consistent with federal, state, and local requirements. 9. Resources at Risk. The OSRP must include a concise list of the sensitive resources that could be impacted by a spill. In lieu of listing sensitive resources, the Lessee may identify the areas that could be impacted by a spill from the Lessee's facility and provide hyperlinks to corresponding Environmentally Sensitive Index Maps and Geographic Response Strategies/Plans for those areas from the appropriate Area Contingency Plan(s). 10. OSRO(s) and SROT(s). The OSRO is an entity contracted by the Lessee to provide spill response equipment and/or manpower in the event of an oil spill. The SROT is the trained persons who deploy and operate oil spill response equipment in the event of a spill, threat of a spill, or an exercise. The OSRP must include a list (with contact information) of the OSRO(s) and SROT(s) who are under contract and/or membership agreement to respond to the WCD of oil from the Lessee's offshore facilities. Evidence of such contracts or membership agreements must be provided in the OSRP. 11. Oil Spill Response Equipment. The OSRP must include a list, or a hyperlink to a list, of the oil spill response equipment that is available to the Lessee through a contract and/or membership agreement with the OSRO(s). The OSRP must include a map that shows the oil spill response equipment storage depot(s) and planned/potential staging area(s) for the oil spill response equipment that would be deployed by the facility operators or the OSRO(s) listed in the plan in the event of a discharge. a. The Lessee must ensure that the oil spill response equipment is maintained in proper operating condition. b. The Lessee must ensure that all oil spill response equipment maintenance, modification, and repair records are kept for a minimum of 3 years. c. The Lessee must provide oil spill response equipment maintenance, modification, and repair records to BSEE OSPD upon request. d. The Lessee or the OSRO must provide BSEE OSPD with physical access to the oil spill equipment storage depots and perform functional testing of the equipment upon request. e. BSEE OSPD may require maintenance, modifications, or repairs to oil spill response equipment or require the Lessee to remove response equipment from being listed in the OSRP if it does not operate as intended. 12. Training. The OSRP must include a description of the training necessary to ensure that the QI, IMT, OSRO(s) and SROT(s) are sufficiently trained to perform their respective duties. The Lessee must ensure that the IMT, OSRO(s), and SROT(s) receive annual training. The Lessee's OSRP must provide the most recent dates of applicable training(s) completed by the QI, IMT, OSRO(s) and SROT(s). The Lessee must maintain and retain training records for 3 years and must provide the training records to BSEE upon request. 13. Worst-Case Discharge (WCD) Scenario. The OSRP must describe the WCD scenario for the facility containing the highest cumulative volume of oil(s). For a regional OSRP covering multiple sub-regions, a WCD scenario must be described for each sub-region. a. If multiple candidate WCD facilities contain the same cumulative volume of oil(s), the WCD facility is the one closest to shore. b. The WCD facility must be identified on the facility map consistent with the "Facility and Oil Information" section. c. The OSRP must identify the subset of oil spill response equipment from the inventory listed in the OSRP that will be used to contain and recover the WCD volume. The OSRP must include timeframes for response resources to deploy to the WCD facility. Timeframes must include times for equipment procurement, loadout, travel, and deployment. 14. Stochastic Trajectory Analysis. The OSRP must include a stochastic spill trajectory analysis for the WCD facility. For a regional OSRP containing multiple WCD scenarios, a stochastic trajectory analysis must be included for each WCD scenario. The stochastic trajectory analysis must: a. Be based on the WCD volume. b. Be conducted for the longest period that the discharged oil would reasonably be expected to persist on the water's surface, or 14 days, whichever is shorter. c. Identify the probabilities for oiling on the water's surface and on shorelines, and minimum travel times for the transport of the oil over the duration of the model simulation. Oiling probabilities and minimum travel times must be calculated for exposure threshold concentrations reaching 10 grams per square meter. Stochastic analysis must incorporate a minimum of 100 different trajectory simulations using random start dates selected over a multi-year period. 15. Response Plan Exercise. The OSRP must include a triennial exercise plan for review and concurrence by BSEE to ensure that the Lessee is able to respond quickly and effectively whenever oil is discharged from the Lessee's facilities. Compliance with the National Preparedness for Response Exercise Program guidelines will satisfy the exercise requirements of this section. If the Lessee chooses to follow an alternative exercise program, the OSRP must provide a			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		description of that program. For a regional OSRP covering multiple sub-regions, the IMT exercise scenarios must be rotated between each sub-region within the triennial exercise period. a. The Lessee must conduct an annual scenario-based notification exercise, an annual scenario-based IMT tabletop exercise (if applicable), and, during the triennial exercise period, at least one functional exercise. b. The Lessee must conduct an annual oil spill response equipment deployment exercise. c. The Lessee must notify BSEE OSPD at least 30 days in advance of any exercise it intends to conduct for compliance with this condition. d. BSEE will advise the Lessee about the options it has to satisfy these requirements and may require changes in the type, frequency, or location of the required exercises, exercise objectives, equipment to be deployed and operated, or deployment procedures or strategies. e. BSEE may evaluate the results of the exercises and advise the Lessee of any needed changes in response equipment, procedures, tactics, or strategies. f. BSEE may periodically initiate unannounced exercises to test the Lessee's spill preparedness and response capabilities. g. The Lessee must maintain and retain exercise records for at least 3 years and must provide the exercise records to BSEE upon request. 16. OSRP Review and Update. The Lessee must review and update the entire OSRP at least once every 3 years and more frequently as needed, starting from the date the OSRP was initially approved. The Lessee must send a written notification to BSEE OSPD upon completion of this review and submit any updates for concurrence. BSEE OSPD may require the Lessee to make changes to the OSRP at any time if it is determined to be outdated or to contain significant inadequacies as discovered through a review of the Lessee's OSRP, information obtained during exercises or actual spill responses, or other relevant information obtained by BSEE OSPD. 17. OSRP Maintenance. The Lessee must submit a revised OSRP to BSEE OSPD within 15 days if any of the following conditions occur: a. The Lessee experiences a change that would significantly reduce its oil spill response capability. b. The calculated WCD volume has significantly increased. c. The Lessee removes a contracted IMT, OSRO, or SROT from the Lessee's plan. d. There has been a significant change to the applicable area contingency plan(s).			
Not Previously Applied					
EJ-1a	Environmental Justice Communications Plan	The Lessee must create an Environmental Justice (EJ) Communications Plan in coordination with populations and communities with EJ concerns that identifies Lessee plans for communicating with these individuals and communities (defined for EJ-1a, and EJ-3 AMMM measures as "communities with environmental justice concerns" as related to Executive Order 14096 and 43 CFR 1508.1(f), referred to herein as "EJ populations"). BOEM will require a Final EJ Communications Plan created in coordination with EJ populations as a term and condition of COP approval, unless, during review of the COP NEPA document and based on COP-specific information on planned activities relative to EJ populations, BOEM determines an EJ Communications Plan is not warranted. The Final EJ Communications Plan shall be submitted to BOEM within 90 calendar days of the Record of Decision on the COP NEPA document. This term and condition would apply to any activity associated with the COP, including those performed by the Lessee's contractor(s). The Final EJ Communications Plan must propose a process for what, how, and to whom the Lessee plans to communicate during activities described in the COP that may affect EJ populations, including construction, operations and maintenance, and decommissioning. Because potential impacts on EJ populations are expected to be much lower during operations and maintenance than during construction or decommissioning, the EJ Communications Plan should reflect different levels of communications, as appropriate, during these different stages. The EJ Communications Plan must be specifically designed for EJ populations and be created in coordination with, at minimum, organizations that serve EJ populations, to inform the Lessee about the best ways to communicate information within EJ populations. The Lessee shall strive to include residents of EJ populations in the creation of the plan. The plan should be made available for review by EJ populations and should outline how the Lessee will advance meaningful engagement on a long-term and continuing basis accounting for each affected community's unique communication and information needs. The EJ Communications Plan must reflect the Lessee's efforts to coordinate with community organizations and leaders in the applicable communities to develop a communication plan that reflects community needs. This AMMM measure is not intended to duplicate communication plan requirements associated with state procurement or state or local permitting processes. The Lessee may utilize efforts or language developed for any state or local requirements to satisfy this Final EJ Communications Plan partially or wholly. The plan shall include EJ populations identified by applicable federal and state-level EJ and related screening tools, or other relevant local information. If states require an EJ Communications Plan with requirements described here, the Lessee may reference the state plan, as applicable. All information must be provided or referenced to fully meet this AMMM measure. In the EJ Communications Plan, the Lessee must: • Describe which EJ populations the EJ Communications Plan will target based on EJ populations identified by the COP NEPA document and any other supplementary information, including communities, organizations, and individual contacts learned about through ongoing engagement activities. The target reach of the EJ Communications Plans should be individuals within communities with environmental justice concerns that may be potentially affected by activities described in the COP. • Describe in detail which activities could impact which areas or populations and at what times; list which activities described in the COP must be included in the EJ Communications Plan and which activities are excluded. • Describe how the EJ Communications Plan was created in coordination with EJ populations and the actions EJ populations want the Lessee to take to demonstrate deep engagement on a long-term continuing basis. • Describe how each potentially affected EJ population desires to be communicated with during activities described in the COP (e.g., communication methods, language needs).	Environmental Justice; Land Use and Coastal Infrastructure	BOEM, BSEE, and USACE	Not Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• Describe how coordination with other Lessees in the region will occur in advance of communication with EJ populations, especially in cases where onshore activities described in the COP may be in proximity to other projects. The intent of coordination is to reduce engagement redundancy and burden on EJ populations. • Describe how the Lessee will communicate when and where activities described in the COP will take place, who they may affect, and how they may affect EJ populations. • Identify a point of contact to receive reports of impacts throughout the life of the project, and provide notice through appropriate communication methods for the EJ populations potentially affected (e.g., postering, radio announcements) so that this point of contact is available to hear about impacts. • Identify the Lessee's approach to handling reports of impacts. • Describe how the Lessee will respond to any concerns or questions from EJ populations during activities described in the COP, and the process the Lessee will undertake to communicate with EJ populations to ensure these concerns or questions are addressed. Also include (1) how the Lessee will handle any questions or concerns that are not related to that Lessee's activities or applicable to regional offshore wind activities, and (2) how the Lessee will address reports of impacts to EJ populations from the Lessee's activities that are not otherwise addressed by existing AMMM measures or terms and conditions of the COP approval. • Describe when, how, and to whom employment opportunities are advertised and how the Lessee plans to maximize access to those opportunities for EJ populations, including but not limited to the communication and advertising for training programs and hiring processes. • Describe how the Lessee will communicate investment or supply chain opportunities to meet any Lessee commitments to diversity or equal access, including but not limited to those included in NY Bight lease stipulation 7.1. • Include a summary of feedback received from EJ populations on the above bullets (see EJ-3).			
EJ-3	Reporting and feedback requirements for EJ Communications Plan	The Lessee must report its activities under AMMM measure EJ-1a under the annual certification of compliance per 30 CFR 285.633, "How do I comply with my COP?". The Lessee shall provide a summary of any EJ Communications Plan activities that occurred. This report shall describe all actions taken and impacts reported that year through implementation of the EJ Communications Plan. The annual report of implementation of the EJ Communication Plan must provide enough details and description of activities for BSEE to determine if the Lessee is implementing the EJ Communications Plan during construction, operations, and decommissioning. The Lessee is expected to adaptively address communications, as well as address reported impacts, over the life of the project. The Lessee is expected to respond to any recommendations made by EJ populations. All written deliverables may be made publicly accessible on BOEM or BSEE's website; they must be submitted in a ready to publish format that also meets requirements of Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended.	Environmental Justice	BOEM, BSEE, and USACE	Not Previously Applied
MUL-22	Received Sound Level Limit (RSLL)	Sound fields generated during impact pile driving of a single foundation in a 24-hour period may not exceed NOAA Fisheries' Level A permanent threshold shift (PTS) limits by the stated date and at the distances below. Current NOAA Fisheries PTS levels that are likely to occur at distances that exceed the proposed ranges are the LF SEL criteria, set at 183 dB (re 1 $\mu Pa^2 s$) weighted LF SEL, and the peak criteria for high-frequency cetaceans (HFC), set at 202 dB re 1 μPa^2 unweighted Lpk, but the Lessee must adhere to any updated thresholds produced by NOAA Fisheries as of the start of installation of piles. • May 1, 2026: After the first three foundations, no exceedance of RSLL beyond 4,921 feet (1,500 meters) from the foundation for 90% of remaining piles. • May 1, 2028: After the first three foundations, no exceedance of RSLL beyond 3,280 feet (1,000 meters) from the foundation for 90% of remaining piles.	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Not Previously Applied
NAV-3	Cable placement for navigation and safety	The Lessee must seek to avoid unfavorable cable placement, including consideration of Federal Aids to Navigation (ATONs), Private Aids to Navigation (PATONs), anchorage areas (including Ambrose Anchorage), Traffic Separation Schemes, and Fairways.	Navigation and Vessel Traffic	BOEM, BSEE, and USCG	Not Previously Applied
OU-2	Mitigation for NEXRAD weather radar systems	The Lessee must coordinate with NEXRAD radar operators, through the Department of Commerce's National Information Telecommunications Administration (NTIA), to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case, the Lessee must notify BOEM and engage radar operators on mitigation efforts. Operational mitigations to NEXRAD weather radar systems may include the following: • Wind turbine curtailment/curtailment agreement • Phased array radars	Other Uses	BOEM and BSEE	Not Previously Applied
OU-4	Decommissioning in marine minerals resource areas	Infrastructure emplaced in marine minerals resource areas must be removed from the marine mineral resource area during decommissioning. In addition, any request to decommission in place in such areas through a departure request must demonstrate to BOEM's satisfaction that no significant impacts to marine minerals resources or their possible extraction or use will occur.	Other Uses	BOEM and BSEE	Not Previously Applied
STF-5	Trailing suction hopper dredge mitigation	If a trailing suction hopper dredge is used offshore, operators must disengage dredge pumps when the dragheads are not actively dredging and therefore working to keep the draghead firmly on the bottom in order to prevent impingement or entrainment of ESA-listed fish and sea turtle species. A state-of-the-art solid-faced deflector that is attached to the draghead must be used on all hopper dredges at all times. Pumps must be disengaged when lowering dragheads to the bottom to start dredging, turning, or lifting dragheads off the bottom at the completion of dredging.	Finfish, Invertebrates, and EFH; Sea Turtles	BOEM and BSEE	Not Previously Applied
VIS-7	Monitoring impacts on scenic and visual resources	In coordination with BOEM, the Lessee must prepare and implement a scenic and visual resource monitoring plan that monitors and compares the visual effects of the wind project during construction and operations/maintenance (daytime and nighttime) to the findings in the COP Visual Impact Assessment and verifies the accuracy of the visual simulations (photo and video). The monitoring plan must include monitoring and documenting the meteorological influences on actual wind turbine visibility over 3 years of operation, with the possibility of extension depending on consistency in data results, from selected onshore key observation points, as determined by BOEM and the Lessee.	Scenic and Visual Resources	BOEM and BSEE	Not Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		In addition, the Lessee shall include monitoring the operation of ADLS in the monitoring plan. The Lessee must monitor the frequency that the ADLS is operative, documenting when (dates and time) the aviation warning lights are in the on position and the duration of each event. Details for monitoring and reporting procedures must be included in the plan.			

[1] AMMM measure identification numbers start with a prefix corresponding to the resource or resources for which they were designed to mitigate and are defined as follows: AQ = air quality; BB = Birds and Bats; BEN = Benthic Resources; BIR = Birds; COMFIS = Commercial and For-Hire Recreational Fishing; CUL = Cultural Resources ; EJ = Environmental Justice; MM = Marine Mammal; MMST = Marine Mammals and Sea Turtles; MUL = Multiple; NAV = Navigation; OU = Other Uses; REC = Recreation and Tourism; ST = Sea Turtle; STF = Sea Turtle and ESA-listed Fish species; VIS = Scenic and Visual Resources; WQ = Water Quality

µPa = micro pascal; ADLS = aircraft detection lighting system; ADS-B = automatic dependent surveillance–broadcast; AMMM = avoidance, minimization, mitigation, and monitoring; AMP = alternative monitoring plan; ARSR-4 = air route surveillance radar; ASLF = ancient submerged landform features; ASR = airport surveillance radar; ASV = autonomous surface vehicles; ATONs = federal aids to navigation; AUV = autonomous underwater vehicle; BBPCMP = Bird and Bat Post-Construction Monitoring Plan; BiOp = biological opinion; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = code of federal regulation; COP = Construction and Operations Plan; CSV = comma-separated values; dB = decibel; DMA = dynamic management area; DoD = Department of Defense; DOI = Department of the Interior; EJ = environmental justice; ESA = Endangered Species Act; FAA = Federal Aviation Administration; FDR = facility design report; FIR = fabrication and installation report; FSC = Finance Section Chief; GARFO = Greater Atlantic Regional Fisheries Office; GHG = greenhouse gas; GPS = global positioning system; HD = high definition; HOV = human-occupied vehicles; HRG = high resolution geophysical; IC = Incident Commander; ICS = Incident Command System; IMPLAN = impact analysis for planning; IMR = injury and mortality reporting; IMT = Incident Management Team; IOOS = integrated ocean observing system; IR = inadvertent returns; ISO = independent system operator; IT = incidental take; JPEG = joint photographic experts group; kHz = kilohertz; km = kilometers; LOA = letter of authorization; LSC = Logistics Section Chief; MEC = munitions and explosives of concern; MMP = marine minerals program; MMPA = Marine Mammal Protection Act; NABat = North American Bat Monitoring Program database; NARW = North Atlantic right whale; NAS = noise attenuation system; NCEI = National Centers for Ecological Information; NEFOP = northeast fisheries observer program; NEFSC = Northeast Fisheries Science Center; NEPA = National Environmental Policy Act; NEXRAD = Next Generation Weather Radar; NJDEP = New Jersey Department of Environmental Protection; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NRHP = National Register of Historic Places; nT = nanotesla; NYSDEC = New York State Department of Environmental Conservation; NYSDOS = New York State Department of State; NYSERDA = New York State Energy Research and Development Authority; OCS = outer continental shelf; OPR = office of protected resources; OSC = Operations Section Chief; OSPD = Oil Spill Preparedness Division; OSRO = Oil Spill Removal Organizations; OSRP = Oil Spill Response Plan; OSS = offshore substation; PAM = passive acoustic monitoring; PATON = private aids to navigation; PDC = project design criteria; PDF = portable document format; POWERON = Partnership for an Offshore Wind Energy Regional Observation Network; PSC = Planning Section Chief; PSO = protected species observer; PTS = permanent threshold shift; QA/QC = quality assurance quality control; QI = Qualified Individual; RP = Recommended Practice; ROV = remotely operated vehicle; RSLL = received sound level limit; RVMP = Reduced Visibility Monitoring Plan; RWSC = Regional Wildlife Science Collaborative; SBP = sub-bottom profiler; SFV = sound field verification; SLR = single lens reflex; SLVIA = seascape, landscape, and visual impact assessment; SMA = seasonal management area; SMS = safety management system; SROT = Spill Response Operating Teams; STDN = sea turtle disentanglement network; T&C = terms and conditions; TIFF = tag image file format; TIMS = technical information management systems USACE = United States Army Corp of Engineers; U.S.C. = United States Code; USCG = United States Coast Guard; USFWS = United States Fish and Wildlife Service; UTC = universal time coordinated; UXO = unexploded ordnance; VFH = very high frequency; WCD = worst-case discharge; WTGs = wind turbine generators

Table G-2. Recommended Practices (RP) for Future Analysis

RP ID[1]	RP Name	Description	Applicable Resource Area
AQ-1	Using a substitute insulator gas in the switch gears and transmission systems to the maximum extent possible	The Lessee should evaluate the feasibility of using non-SF_6 switchgear and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. To the maximum extent feasible, the Lessee should use a substitute insulator gas rather than SF6 in the switchgear and transmission systems. If the Lessee determines using non-SF6 switchgear is infeasible then the Lessee should provide written justification of this determination to BOEM. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-2	Cleaner fuels for vessels, equipment, and vehicles engaged in activities on the OCS	The Lessee is encouraged to replace diesel fuel and marine fuel oil with alternative fuels such as natural gas, propane, or hydrogen, to the extent that use of such alternative fuels is feasible and provides emissions reductions. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-3	Electrification of vessels, equipment, and vehicles engaged in activities on the OCS	The Lessee is encouraged to replace combustion engines with zero-emissions technology (fuel cell-electric or battery-electric) if feasible. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-4	Exhaust aftertreatment for vessels engaged in activities on the OCS	The Lessee should evaluate, on a vessel-specific basis, the use of exhaust aftertreatments such as emission control technologies, for example, scrubbers for SO_2 and selective catalytic reduction for NO_X. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-5	Exhaust aftertreatment for older engines in vehicles and equipment engaged in activities on the OCS	The Lessee is encouraged to use diesel particulate filters and diesel oxidation catalysts to retrofit older (USEPA Tiers 1–3) diesel engines if feasible. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-6	Zero-emissions technologies	The Lessee is encouraged to require its contractors to use ports equipped with shore power and zero-emissions material-handling equipment, and construction firms that offer alternative-fueled or zero-emissions equipment and vehicles.	Air Quality and GHG Emissions
AQ-7	Diesel engine emissions standards	The Lessee is encouraged to require contractors using diesel engines that use a combination of combustion and post-combustion controls to meet or exceed applicable marine engine standards. These include the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI for foreign vessels; 40 CFR Part 1039 for Tier 1 and 2 domestic marine diesel engines smaller than 37 kW- Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines; 40 CFR Part 1042 for Tier 1 and 2 domestic marine diesel engines larger than 37 kW- Control of Emissions from New and In-Use Marine Compression-Ignition Engines and Vessels; and 40 CFR Part 1042 for Tier 3, Tier 4 Interim, and Tier 4 Final domestic marine diesel engines- Control of Emissions from New and In-Use Marine Compression-Ignition Engines and Vessels. On-road engines, non-road engines, and aircraft engines will meet or exceed similar standards, where practicable.	Air Quality and GHG Emissions

RP ID[1]	RP Name	Description	Applicable Resource Area
AQ-8	Technical feasibility analysis of air quality RPs	This measure encourages the Lessee to perform and present a technical feasibility analysis for air quality RPs 1 through 5 (AQ-1 – AQ-5), ensuring a comprehensive review of each measure's effectiveness, and readiness for implementation. The technical feasibility analysis should be submitted to BOEM/BSEE as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages.	Air Quality and GHG Emissions
BB-4	Bird and bat monitoring plan framework	The Lessee should develop a framework for a Bird and Bat Post-Construction Monitoring Plan (BB-3) in coordination with BOEM and USFWS. The Lessee is encouraged to include this framework with their initial COP submission or subsequent updated versions.	Bats, Birds
BEN-3	Benthic Survey Guidelines	The Lessee is encouraged to follow the BOEM Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585 (updated June 2019, at: https://www.boem.gov/sites/default/files/renewable-energy-program/Regulatory-Information/BOEM-Renewable-Benthic-Habitat-Guidelines.pdf) with regards to pre-, during- and post-construction benthic monitoring survey plan design.	Benthic
COMFIS-4	Fisheries mitigation	**Static cable design elements** are recommended: • All static cables should be buried to a minimum depth of 3 feet below stable seabed where technically feasible. Technical feasibility constraints include seabed conditions that preclude burial, such as telecommunication cable crossings. Deeper cable burial depths may be required dependent on risks identified in cable route design (see the Carbon Trust's Cable Burial Risk Assessment Methodology at: https://ctprodstorageaccountp.blob.core.windows.net/prod-drupal-files/documents/resource/public/cable-burial-risk-assessment-guidance.pdf). • The Lessee should avoid installation techniques that raise the profile of the seabed, such as the ejection of large, previously buried rocks or boulders onto the surface. The ejection of this material may damage fishing gear. If raising the profile of the seabed is unavoidable, the Lessee should propose measures in the COP to minimize the total area of impact through measures such as removing potential obstructions from areas where bottom-tending fishing gear is actively used or consolidating such obstructions in areas where bottom-tending fishing gear is not actively used. • If needed, cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure ensures that seafloor cable protection does not introduce new obstructions for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered or sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the Lessee should use materials that mirror the benthic environment. • Where technically and economically feasible, cables should share corridors and minimize the total area disturbed. **Project design** should be planned in coordination with fisheries: • The facility design should seek to maximize existing access to fisheries in balance with other siting constraints by considering: a. Transit within the project area and traditional fishing activities within the project area. b. Consolidation of infrastructure, where practicable, to reduce space-use conflicts. c. Technologies to reduce total project area and meet energy production commitments. • Turbine locations should be sited to avoid areas of commercial fishery production such as known sensitive benthic features and natural and artificial reefs. • Facility planning should use nature-inclusive designs (see Evaluating the Effectiveness of Nature Inclusive Design Materials at: https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP_2022-2023.pdf), where applicable, to maximize available habitat for fish. • Installation techniques and time windows should minimize disruption to fishing activities (e.g., simultaneous lay and burial, or conducting activity during the appropriate time of year). To improve **safety** at sea in and around offshore wind facilities, BOEM recommends that the Lessee consider the following measures in its plan submittals: • Charting all facilities and obstructions resulting from construction and operations of an offshore wind energy facility and providing that information to NOAA, USCG, and navigational software companies. • Employing liaisons with experience in the commercial fishing industry to provide safety and communication services during construction. • Monitoring cable burial in real-time and reporting all potential hazard events to USCG as soon as possible throughout the life of the project. • Using digital information technology platforms (e.g., smartphone applications) to bring together survey and construction schedules and locations in addition to standard local notices to mariners via the USCG. • Marking facilities and appurtenances with permanent identification of the project and company. • Providing training opportunities for the commercial fishing industry to simulate safe navigation through a wind facility in various weather conditions and at various speeds. • Monitoring safety threats (e.g., radar disruption, ice shedding, vessel allisions and collisions, security threats, unexploded ordnance/munitions of explosive concern, and impacts on search and rescue efforts) throughout the life of a project. • Consulting with the fishing industry and USCG to identify which structures would be most appropriate for Automatic Identification System (AIS) transponders consistent with BOEM's Lighting and Marking Guidelines (https://www.boem.gov/2021-lighting-and-marking-guidelines). • Considering Lessee-funded radar system upgrades for commercial and for-hire recreational fishing vessels (e.g., solid state Doppler-based marine vessel radar systems; see National Academies of Science Engineering and Medicine 2022).[4]	Commercial and For-Hire Fishing
COMFIS-5	Fisheries Survey Guidelines	The Lessee should follow the BOEM Fisheries Survey Guidelines (Fisheries Guidelines, updated March 27, 2023, at: https://www.boem.gov/sites/default/files/documents/about-boem/Fishery-Survey-Guidelines.pdf) with regards to pre-, during- and post-construction fisheries monitoring survey plan design.	Commercial and For-Hire Fishing; Marine Mammals
COMFIS-7	Fisheries Compensation Fund	The Lessee should consider contracting with a neutral third-party, such as a regional fund administrator, to process claims, manage, and disburse funds, and handle appeals.	Commercial and For-Hire Fishing
CUL-7	Section 106 mitigation fund	Through consultation, BOEM may request that the Lessee financially contributes to a third-party managed compensatory mitigation fund to address visual impacts on aboveground historic properties related to OCS offshore wind activities.	Cultural Resources
EJ-1b	Draft Environmental Justice Communication Plan	The Draft Environmental Justice (EJ) Communications Plan should be created in coordination with EJ populations and identify Lessee plans for communicating with EJ communities or populations (defined for EJ-1a and EJ-3 AMMM measures as "communities with environmental justice concerns" as related to Executive Order 14096 and the revised implementation	Environmental Justice

[4] National Academies of Science Engineering and Medicine. 2022. Wind Turbine Generator Impacts to Marine Vessel Radar. Washington, D.C.: The National Academies Press. https://doi.org/10.17226/26430.

RP ID[1]	RP Name	Description	Applicable Resource Area
		regulations for NEPA (National Environmental Policy Act Implementing Regulations Revisions Phase 2; 89 Federal Register 35554 – 35577 (May 1, 2024)), referred to herein as “EJ populations”). The Lessee should develop a Draft EJ Communications Plan early in the project planning process. The Lessee is encouraged to submit a Draft EJ Communications Plan to BOEM for BOEM’s feedback prior to publication of the Draft COP NEPA document. This will allow sufficient time for coordination with EJ populations during the development of an EJ Communications Plan in advance of activities. The Draft EJ Communications Plan should propose a process for how the Lessee plans to communicate during activities described in the COP, including construction, operations, and decommissioning. Because potential impacts on EJ populations are expected to be much lower during operations than during construction or decommissioning, the Draft EJ Communications Plan should reflect different levels of communications, as appropriate, during these different stages. The Lessee may utilize efforts or language developed for any state requirements (e.g., measures identified through state renewable energy procurement processes or as requirements of state permits) to satisfy this Draft EJ Communications Plan partially or wholly. In order to meet the intent of this RP to enhance ongoing Lessee communications with EJ populations, this Draft EJ Communications Plan should be developed in consultation with community leaders and community organizations who work with the identified EJ population(s). Plans should be specifically designed for EJ populations and advance meaningful engagement based on each affected community’s unique communication and information needs. EJ populations should be identified by any applicable federal and state-level EJ and related screening tools, or other relevant local information.	
EJ-2	Environmental Justice Impact Mitigation Plan	An EJ Impact Mitigation Plan (Plan) is recommended if EJ populations would potentially be impacted by onshore construction activities or any activity associated with the COP, including activities of the Lessee’s contractor(s). The Lessee is encouraged to submit a Draft Environmental Justice Impact Mitigation Plan during COP review, prior to publication of the Draft COP NEPA document. Submission of a Final Environmental Justice Impact Mitigation Plan is recommended before construction begins. The Environmental Justice Impact Mitigation Plan should be created in coordination with EJ populations, and should describe existing state or local requirements (e.g., noise ordinances; dust abatement requirements) that may reduce impacts in order to avoid any duplication. The plan should also describe scenarios of what actions, including distribution of mitigation resources or other mitigation strategies, the Lessee will take if the Lessee receives notice of an impact occurring. For engagement with EJ populations during development of the Impact Mitigation Plan, BOEM encourages the Lessee to coordinate with other Lessees, per the New York Bight Lease Sale lease stipulation (87 Federal Register 2446, VI, (a)), and to carry out engagement in coordination with the development of the communications plan (EJ-1a). The EJ Impact Mitigation Plan should provide sufficient detail on how impacts can be reported, how eligibility for action will be determined, and how EJ populations will have access to mitigation resources or how other mitigation strategies will be implemented. The Impact Mitigation Plan should include a description of all potential mitigation resources or strategies and the duration for which distribution of resources or strategy implementation will occur based on anticipated activity length and localized impacts. The plan should also outline roles and responsibilities of households and the Lessee, and there should be clear guidelines around principles of equity, transparency, and fairness. The EJ Impact Mitigation Plan should demonstrate that potentially affected EJ populations were coordinated with and had multiple and varied opportunities to provide information about the most effective and equitable strategies for all processes, including reporting of impacts, resource distribution, or implementation of mitigation strategies.	Environmental Justice
MM-2	Real-time PAM monitoring and alert system for baleen whales	A near real-time passive acoustic monitoring (PAM) system for the detection of baleen whales in the NY Bight during offshore wind development activities should be implemented, with an alert system/notice to mariners/construction operators. This could be achieved through the deployment of several ocean gliders or fixed PAM systems in the broader NY Bight area. The equipment could be deployed anywhere there is offshore wind development activities, including in the lease areas, but may be particularly useful between lease areas where the placement of other real-time PAM systems is not already directed, or near transit or cable-laying corridors, or other locations where real-time alerting of marine mammal presence would be beneficial to the offshore wind-related activities occurring in one or more lease areas. Every effort should be made to deploy equipment in advance of any on-water activity, including site characterization work, construction work, etc., to provide situational awareness toward vessel strike risk. Each system should be equipped with reliable PAM technology and marine mammal detection and classification software. Detections will be transmittable to a PAM analyst for verification. The systems will be capable of alerting offshore wind developers that a baleen whale has been detected in the general area of offshore wind development-related activity, through methods such as Whale Alert or an offshore wind-specific notification system. This could also be achieved through partnership with other industries, academia, NGOs, and federal agencies in a regional effort. A plan detailing any proposed localization system and analysis methods should be submitted and discussed with BOEM and other relevant permitting agencies in advance of deployment. This real-time PAM alert system will increase the opportunity to detect marine mammals in the greater NY Bight area, providing the opportunity for increased situational awareness (for vessel strike avoidance) to PSOs and others of marine mammal presence in the area. In addition, raw data or data products associated with real-time PAM should be submitted for archiving at the National Centers for Environmental Information or a similar entity determined by BOEM as soon as practicable after instrument retrieval. The archived data will be integrated into community PAM efforts in the broader region, such as through the Regional Wildlife Science Collaborative, to understand marine mammal distribution/occurrence in the area, which can then be used to inform future predictions of potential impacts to marine mammals.	Marine Mammals
MM-7	Additional vessel-related measures for the North Atlantic right whale	The Lessee should develop and implement the project's schedule to reduce vessel density during the times of year when North Atlantic right whales are most likely to occur in lease areas and along vessel routes. The Lessees should coordinate across different offshore wind development projects to reduce cumulative vessel density within the region to the extent practicable. Time periods of highest risk include but are not limited to during foraging and migration and times when mother-calf pairs, pregnant females, surface active groups (indicative of breeding or social behavior), or aggregations of three or more whales (indicative of feeding or social behavior) are, or are expected to be, present. Time periods should be defined based on the best available scientific information.	Marine Mammals
MM-8	Effectiveness criteria for vessel strike avoidance plans	The Lessee should include in its vessel strike avoidance plans the effectiveness criteria being applied. The joint Regional Wildlife Science Collaborative for Offshore Wind (RWSC) and Marine Technology Society Technology Workshop Series may be a good resource for such effectiveness criteria.	Marine Mammals
MUL-5	Low noise best practices	For onshore and offshore project activities and across all phases of construction and operations, operators should use equipment, technology, and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment. See the following as examples: low noise foundations (MUL-6), vessel noise reduction guidelines (MUL-7), and the received sound level limit (MUL-22).	Bats; Benthic; Birds; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Land Use and Coastal Infrastructure; Marine Mammals; Recreation and Tourism; Sea Turtles

<table>
<tr><th>RP ID[1]</th><th>RP Name</th><th>Description</th><th>Applicable Resource Area</th></tr>
<tr><td>MUL-6</td><td>Low noise foundations</td><td>BOEM encourages the use of low noise practices in foundation installation. The use of non-pile-driving foundation types (e.g., suction buckets, gravity-based foundations, etc.) should be considered first. If not practicable, then the use of the best available quieting technology should be applied to reach the received sound level limit (MUL-22). (See Appendix J for discussion on non-pile-driving foundations and noise abatement.) In addition, through the COP or a separate report, the Lessee should submit to BOEM (on behalf of BOEM, BSEE, NMFS and USACE) justification for why the use of non-pile-driving foundations is not possible.</td><td>Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-7</td><td>Vessel noise reduction guidelines</td><td>To the extent reasonable and practicable, BOEM encourages the Lessee to follow the most current International Maritime Organization's (IMO) Guidelines for the reduction of underwater radiated noise, including propulsion noise, machinery noise, and noise from dynamic positioning systems of any vessel associated with the project. BOEM encourages the Lessee to use quieter ships wherever possible, especially for new vessel builds, and contribute to the Experience Building Phase as outlined by the IMO endorsed Action Plan developed by the Sub-Committee on Ship Design and Construction for underwater noise reduction.</td><td>Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-10b</td><td>Avoid spawning and developmental habitat of sturgeon during data collection and site survey activities</td><td>No geotechnical or bottom-disturbing activities should take place during the spawning/rearing season within freshwater reaches of rivers where Atlantic or shortnose sturgeon spawning occurs. Any survey plan that includes geotechnical or other benthic sampling activities in freshwater reaches (salinity 0-0.5 ppt) of such rivers will identify a time of year restriction that will avoid such activities during the time of year when Atlantic sturgeon spawning and rearing of early life stages occurs in that river. Time of year restrictions include the following:
<table><tr><td>River</td><td>No Work Window</td><td>Area Affected</td></tr><tr><td>Hudson</td><td>April–July</td><td>Upstream of Newburgh, NY – Beacon Bridge/Rt 84</td></tr><tr><td>Delaware</td><td>April–July</td><td>Upstream of the Delaware Memorial Bridge</td></tr></table></td><td>Finfish, Invertebrates, and EFH; Benthic</td></tr>
<tr><td>MUL-10c</td><td>Minimize vessel interactions with listed species during use of a moon pool</td><td>During times of year when sea turtles are known to occur in the survey area and if there is an intention to utilize a moon pool for the required activities, the following RPs should be followed:
Closure of the Hull Door:
Should the moon pool have a hull door that can be closed, then prior to and following closure, the moon pool must be monitored continuously by a dedicated crew observer with no other tasks to ensure that no individual protected species is present in the moon pool area. If visibility is not clear to the hull door from above (e.g., turbidity or low light), 30 minutes of monitoring is required prior to hull door closure.
If a protected species is observed in the moon pool prior to closure of the hull door, the hull door must not be closed, to the extent practicable. If the observed animal leaves the moon pool, the operator may commence closure. If the observed animal remains in the moon pool, contact BSEE prior to closure of the hull doors according to reporting requirements (see Reporting of Observations of Protected Species within an Enclosed Moon Pool below).
Reporting of Observations of Protected Species within an Enclosed Moon Pool:
If a protected species is observed within an enclosed moon pool and does not demonstrate any signs of distress or injury or an inability to leave the moon pool of its own volition, RPs described in this section should be followed (only in cases where they do not jeopardize human safety). Although this particular situation may not require immediate assistance and reporting, a protected species could potentially become disoriented with their surroundings and may not be able to leave the enclosed moon pool of their own volition. In order for operations requiring use of a moon pool to continue, the following reporting RPs should be followed:
Within 24 hours of any observation, and daily after that for as long as an individual protected species remains within a moon pool (i.e., in cases where an ESA listed species has entered a moon pool but entrapment or injury has not been observed), the following information should be reported to BSEE (protectedspecies@bsee.gov). For an initial report, all information described above should be included.
For subsequent daily reports:
Describe the animal's status to include external body condition (e.g., note any injuries or noticeable features), behaviors (e.g., floating at surface, chasing fish, diving, lethargic, etc.), and movement (e.g., has the animal left the moon pool and returned on multiple occasions?);
Description of current moon pool activities, if the animal is in the moon pool (e.g., drilling, preparation for demobilization, etc.);
Description of planned activities in the immediate future related to vessel movement or deployment of equipment;
Any additional photographs or video footage of the animal, if possible;
Guidance received and followed from NMFS liaison or stranding hotline that was contacted for assistance;
Whether activities in the moon pool were halted or changed upon observation of the animal; and
Whether the animal remains in the moon pool at the time of the report, or if not, the time/date the animal was last observed.
BOEM does not advocate the lowering of crew members into the moon pool to free protected species and NMFS should be contacted if protected species are encountered in the moon pool.</td><td>Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-12</td><td>Ecological design elements</td><td>The Lessee is encouraged to incorporate ecological design elements into the project design where practicable. For example, nature-inclusive design products are an alternative to traditional concrete that enhance or encourage the growth of flora or fauna when placed in a marine environment and could result in reduced GHG emissions compared to conventional concrete. Other examples include artificial reefs or using nature-based scour protection such as oyster beds.</td><td>Air Quality and GHG Emissions; Benthic; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-14b</td><td>MEC Avoidance Best Practices</td><td>If MEC avoidance is not possible, submitted UXO/MEC avoidance plans should follow, when finalized, the US Committee on the Marine Transportation System general guidance addressing MEC at: https://www.cmts.gov/Portals/75/Documents/page_offshore_energy/DOT-OST-2023-0117-0001_attachment_1.pdf</td><td>Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-18</td><td>Shared transmission corridor</td><td>Lessees should coordinate transmission infrastructure among projects. Where practicable, transmission infrastructure should use shared intra- and interregional connections, have requirements for meshed infrastructure, apply parallel routing with existing and proposed linear infrastructure (including export cables and other existing infrastructure such as power</td><td>Benthic; Coastal Habitat and Fauna; Commercial and For-Hire Fishing;</td></tr>
</table>

RP ID[1]	RP Name	Description	Applicable Resource Area
		and telecommunication cables, pipelines), and have a limited combined footprint to minimize impacts and maximize potential capacity. Where possible, Lessees should incorporate cable siting principles and routing measures for export cables and associated substations developed from the Atlantic Offshore Wind Transmission Study and the BOEM/DOE transmission planning effort, the NYSERDA's Offshore Wind Cable Corridor Constraints Assessment,[5] associated NYS Public Service Commission orders, and the results of other state and ISO/RTO transmission planning processes, to maximize the utility of Points of Interconnection (POIs). Lessees considering landfall in New Jersey should also comply with the results of the state agreement approach (SAA)[6] and any other future procurements resulting from similar initiatives.	Cultural Resources; Finfish, Invertebrates, and EFH; Marine Mammals; Navigation and Vessel Traffic; Sea Turtles; Wetlands
MUL-21	Use of new and emerging technology [7]	In addition to employing best available safest technology, the Lessee is encouraged to adopt new and emerging technologies to avoid or minimize potential impacts in both offshore and nearshore environments, where practicable. Examples include the use of jet plows, closed loop cooling systems, trenchless technology, gravity-based structures or foundation designs that do not rely on pile driving, and protected species detection technologies including MERLIN radar systems, thermal imaging cameras, acoustic devices, and the integrations of these data streams for real-time monitoring. In addition, the Lessee should explore opportunities to upgrade/retrofit equipment to the best available technology if it becomes available during project operations.	Bats; Benthic; Birds; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles, Water Quality
MUL-23	Adjust project design to reduce impacts	The Lessee should review and refer to the Information Guidelines for Renewable Energy Construction and Operations Plan Best Management Practices (Attachment A, https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines_Technical_Corrections.pdf) during project planning to avoid or reduce potential impacts on important environmental resources, including sensitive habitats. Additional, project design considerations include: • Using cable installation methods, such as horizontal directional drilling, that avoid and minimize adverse impacts on sensitive habitats and difficult-to-replace resources; • Avoiding routing export cables through estuaries and embayments to reduce impacts on numerous sensitive habitats and difficult-to-replace resources as well as many sensitive life stages of various species; • Ensuring all mooring systems and ancillary equipment are contained inside the approved lease area to reduce impacts on fishing, navigation, and other uses; • Using outputs from marine mammal vessel strike models to inform project design; • Considering all potential WTG positions to allow for flexibility in project design due to identification of sensitive habitats or cultural properties through the environmental review process; and • Using micrositing as a tool for identifying and avoiding sensitive habitats.	Bats; Benthic; Birds; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Wetlands; Sea Turtles
MUL-25	Consistent turbine layout, markings, and lighting	The Lessee should employ consistent turbine grid layouts, spacing, markings, and lighting among lease areas to minimize navigational hazards and facilitate other ocean uses such as fishing and recreational activities. BOEM recommends the lessee have one of the two lines of orientation in the grided layout be spaced at least 1 nautical mile (1.9 kilometers) apart to support navigation safety and Search and Rescue (SAR). This recommended spacing is based on the USCG's 2020 Massachusetts and Rhode Island Port Access Route Study (https://www.navcen.uscg.gov/sites/default/files/pdf/PARS/FINAL_REPORT_PARS_May_14_2020.pdf). The spacing would also preserve structure-free areas to facilitate seabird passage and fishing operations. Also, per lease stipulations if applicable, adjacent lease areas that do not adopt the same layout must have an additional setback from shared borders. In accordance with BOEM lighting and marking guidelines, and USCG and FAA lighting and marking requirements, the Lessee must ensure that all structures are properly marked and lighted.	Bats; Birds; Commercial and For-Hire Fishing; Navigation and Vessel Traffic
MUL-26	Coordination for regional monitoring and surveys	Lessees are encouraged to: • Coordinate monitoring and survey efforts across lease areas in the NY Bight to standardize approaches, understand potential impacts to resources at a regional scale, and maximize efficiencies in monitoring and survey efforts; • Develop monitoring and survey plans that meet regional data requirements and standards, such as ROSA Offshore Wind Project Monitoring Framework and Guidelines (https://www.rosascience.org/wp-content/uploads/2022/09/ROSA-Offshore-Wind-Project-Montioring-Framework-and-Guidelines.pdf), the Regional Wildlife Science Collaborative's Science Plan (https://rwsc.org/science-plan/), and the NMFS/BOEM Federal Survey Mitigation Implementation Strategy; and • Make results from monitoring publicly available, for example through PNNL's offshore wind metadata tool (https://tethys.pnnl.gov/offshore-wind-metadata).	Benthic; Birds; Bats; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles
MUL-27	Minimize sediment disturbance	The Lessee should employ methods to minimize sediment disturbance, including, but not limited to, the use of midline buoys to prevent cable sweep, not side casting materials, and removal and reuse of dredged material for backfill or other beneficial use where practicable.	Benthic; Finfish, Invertebrates, and EFH; Water Quality; Sea Turtles
MUL-28	Inadvertent Returns (IR) Plan and drilling fluids	The Lessee should coordinate with applicable agencies to develop an Inadvertent Returns (IR) Plan to address prevention, control, and clean-up of potential IR, which is the unintended release of drilling fluids to the surface during drilling operations. To the extent practicable, use biodegradable drilling solution, and recirculate and recycle drilling fluids used during HDD construction to minimize required water use. Avoid discharging drilling fluids onto the seabed.	Benthic; Finfish, Invertebrates, and EFH; Water Quality
MUL-39	Electrical shielding on underwater cables	The Lessee should use standard underwater cable design that mitigates the intensity of electromagnetic fields (EMF) at the seafloor. EMF will be further refined as part of the design or cable burial risk assessment.	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles
NAV-4	Marine Vessel Radar	Where possible, the Lessee should adhere to the recommendations for mitigation to marine radar interference from the National Academy of Science: *Wind Turbine Generator Impacts to Marine Vessel Radar* (2022).	Navigation and Vessel Traffic
OU-8	Marine minerals resource area avoidance	The Lessee should ensure that bottom-disturbing activities avoid, to the maximum extent practicable, nearshore borrow areas and OCS sediment resources. Any activity that lasts more than 180 days and is located within 500 lateral meters of any marine minerals resource areas or limits the long-term use of the resource is considered bottom disturbing. The Lessee should use its geophysical and geological information collected in/along proposed corridors to demonstrate and verify the existence of sand resource or dearth of sand resource and estimate (via range) the possible implication of cable crossing on volume access. The Lessee is responsible for responding to any request from BOEM Marine Minerals Program (MMP),	Other Uses

[5] For a list of specific cable siting principles, refer to Section 4.1 in the Offshore Wind Cable Corridor Constraints Assessment at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/2306-Offshore-Wind-Cable-Corridor-Constraints-Assessment--completeacc.pdf.
[6] https://www.nj.gov/bpu/pdf/boardorders/2022/20221026/8A%20ORDER%20State%20Agreement%20Approach.pdf.
[7] Appendix B, *Supplemental Information and Additional Figures and Tables*, Section B.9 describes examples of new and emerging technologies that the Lessee could research and consider for adoption as part of MUL-21.

RP ID[1]	RP Name	Description	Applicable Resource Area
		USACE, and state resource agencies (e.g., NJDEP, NYSDEC, NYSDOS) in writing and to show good faith efforts to avoid sand resources to the maximum extent practicable or explain why another alternative is not technically or economically feasible.	
STF-1	Monitoring on strategically placed WTGs	The Lessee is encouraged to incorporate technologies for detecting tagged sea turtles and highly migratory fish in its project to monitor the effect of increases in habitat use and residency around WTG foundations. The Lessee is encouraged to share monitoring results and propose new or additional mitigation measures and/or monitoring methods if appropriate.	Finfish, Invertebrates, and EFH; Sea Turtles
VIS-1	Onshore transmission tower visual contrast mitigation	The Lessee should select a transmission tower type that has the least amount of visual contrast within the surrounding setting and the extended landscape within view of which the transmission line is routed in order to avoid undue and unnecessary visual impact. Monopoles typically have less visual contrast within built environments, whereas lattice towers typically have less visual contrast in more natural settings. The Lessee should color-treat the transmission tower darker grays (chemically treated galvanized finishes) to reduce visual contrast or powder-coat the tower with Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or a BOEM-approved equivalent submitted by the Lessee for settings where Covert Green or Shadow Gray does not minimize the visual contrast. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore transmission tower visual contrast mitigation. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov.	Scenic and Visual Resources
VIS-2	Onshore substation visual contrast mitigation	The Lessee should color treat all substation facilities the same color, and color-treat them to minimize visual contrast with the surrounding setting, and the extended landscape within view. The default color choice for substations should be Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or a BOEM-approved equivalent submitted by the Lessee for settings where Covert Green or Shadow Gray does not minimize the visual contrast in order to avoid undue and unnecessary visual impact. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore substation visual contrast mitigation. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov.	Scenic and Visual Resources
VIS-3	Onshore overhead transmission conductors visual contrast mitigation	The Lessee should use non-specular conductors for overhead transmission powerlines to avoid glare commonly associated with untreated conductors to avoid undue and unnecessary visual impact. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore overhead transmission conductors visual contrast mitigation.	Scenic and Visual Resources
VIS-4	Onshore overhead transmission line insulator visual contrast mitigation	The Lessee should use polymer insulators to minimize glare commonly associated with glass insulators. The Lessee should use polymer insulators that are a color that minimizes visual contrast with the surrounding setting and the extended landscape that is within view to avoid undue and unnecessary visual impact. The default color choice for polymer insulators substations should be Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or Sudan Brown, or a BOEM-approved equivalent submitted by the Lessee for settings where Covert Green or Shadow Gray or Sudan Brown do not minimize the visual contrast. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore overhead transmission line insulator visual contrast mitigation.	Scenic and Visual Resources
VIS-5	Onshore facility security fencing visual contrast mitigation	The Lessee should ensure galvanized and other types of security fencing are treated to eliminate glare and color-treated to minimize visual contrast with the surrounding setting and the extended landscape that is within view to avoid undue and unnecessary visual impact. Methods include vinyl-coating, powder-coating, and oxidizing treatments. Colors should be dark brown, dark grays, or dark brown (oxidizing treatments only). The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore facility security fencing visual contrast mitigation.	Scenic and Visual Resources
VIS-6	Offshore and Onshore facility lighting	In order to avoid undue and unnecessary visual impact, the Lessee should ensure artificial light at night needed for nighttime operations and security at offshore and onshore facilities such as wind turbine generators, operational and maintenance facilities, offshore and onshore substations and booster stations, and others follows the night lighting principles to avoid light pollution and the artificial lighting BMPs outlined in National Park Service Sustainable Lighting Best Principles (https://www.nps.gov/subjects/nightskies/sustainable-outdoor-lighting.htm) and the Bureau of Land Management Technical Note 457 available at https://www.blm.gov/sites/default/files/docs/2023-05/IB2023-038_att1.pdf. The Lessee should prepare photo simulations of proposed facilities with and without offshore and onshore facility lighting mitigation.	Scenic and Visual Resources; Birds
VIS-8	Scenic and Visual Resources Mitigation Analysis	The Lessee should prepare a methodology for using and integrating BOEM's 2021 SLVIA guidance into the COP SLVIA, and submit to BOEM for review and comment before initiating the impact assessment. The COP SLVIA should also include onshore facilities associated with the offshore wind energy project. Onshore facilities should incorporate visual RPs 1 through 6 (VIS-1 – VIS-6). The SLVIA should include photo simulations, time-lapse video simulations, and/or other forms of visualization technology showing the existing condition, proposed changes to the offshore and onshore visual environment, and effectiveness of mitigation measures, if not included as a part of the proposed action.	Scenic and Visual Resources
REC-1	Nearshore construction timing restriction	The Lessee should prioritize scheduling of nearshore construction activities for outside the summer tourist season, which is generally between Memorial Day and Labor Day.	Land Use and Coastal Infrastructure, Recreation and Tourism

[1] RP measure identification numbers start with a prefix corresponding to the resource or resources for which they were designed to mitigate and are defined as follows: AQ = air quality; BB = Birds and Bats; BEN = Benthic Resources; BIR = Birds; COMFIS = Commercial and For-Hire Recreational Fishing; CUL = Cultural Resources ; EJ = Environmental Justice; MM = Marine Mammal; MMST = Marine Mammals and Sea Turtles; MUL = Multiple; NAV = Navigation; OU = Other Uses; REC = Recreation and Tourism; ST = Sea Turtle; STF = Sea Turtle and ESA-listed Fish species; VIS = Scenic and Visual Resources; WQ = Water Quality

AIS = automatic identification system; AMMM = avoidance, minimization, mitigation, and monitoring; BMPs = best management practices; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = code of federal regulation;
COP = Construction and Operations Plan; DOE = Department of Energy; EMF = electromagnetic field; ESA = Endangered Species Act; FAA = Federal Aviation Administration; FDR = facility design report; FIR = fabrication and installation report; GHG = greenhouse gas; HDD = horizontal directional drilling; IMO = international maritime organization; IMPLAN = impact analysis for planning; IR = inadvertent returns; ISO = independent system operator; kW= kilowatt; MARPOL = The International Convention on the Prevention of Pollution from Ships; MEC = munitions and explosives of concern; NEPA = National Environmental Policy Act; NGOs = non-governmental organization; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NO_X = nitrogen oxides; NRHP = National Register of Historic Places; nT = nanotesla; NYS = New York State;
NYSERDA = New York State Energy Research and Development Authority; OCS = outer continental shelf; PAM = passive acoustic monitoring; PNNL = Pacific Northwest National Laboratory; POI = point of interconnection; PSO = protected species observer; RP = Recommended Practice;
ROSA = Responsible Offshore Science Alliance; RTO = regional transmission organization; RWSC = Regional Wildlife Science Collaborative; SAA = state agreement approach; SAR = search and rescue; SF_6 = sulfur hexafluoride; SO_2 = sulfur dioxide; USCG = United States Coast Guard; USEPA = United States Environmental Protection Agency; USFWS = United States Fish and Wildlife Service; UXO = unexploded ordnance; WTGs = wind turbine generators

Appendix H: Seascape, Landscape, and Visual Impact Assessment

H.1 Introduction

This appendix describes the seascape, landscape, and visual impact assessment (SLVIA) methodology and key findings that the Bureau of Ocean Energy Management (BOEM) used to identify the potential impacts of offshore wind structures (wind turbine generators [WTGs] and offshore substations [OSSs]) on scenic and visual resources in the geographic analysis area. The SLVIA methodology applies to any offshore wind energy development proposed for the Outer Continental Shelf (OCS) and incorporates by reference the detailed description of the methodology described in the *Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States* (BOEM 2021). The analysis in this appendix relies on and incorporates by reference the assessment of the six New York Bight (NY Bight) lease areas conducted by Argonne National Laboratory (Argonne) and BOEM in accordance with the SLVIA methodology, *Ocean, Seascape, Landscape, and Visual Impact Assessment of the New York Bight Offshore Wind Lease Areas* (Argonne 2024). These documents are available on the BOEM website.

Section H.2, *Method of Analysis*, of this appendix describes the specific methodology used to apply the SLVIA methodology to the NY Bight projects, and Section H.3, *SLVIA Results,* summarizes the wind farm distances, fields of view (FOVs), noticeable elements, visual contrasts, scale of change, and prominence that contributed to the determination of impact levels for ocean, seascape, and landscape and each key observation point (KOP) for the NY Bight projects. Section H.4, *Cumulative Impacts of NY Bight Projects*, describes the cumulative impacts from the NY Bight projects in combination with other ongoing and planned offshore wind projects. Detailed maps of character areas, KOPs, and other scenic resources within view of each lease area and of the six NY Bight lease areas collectively are contained in Argonne (2024). Visual simulations of the NY Bight projects alone, other ongoing and planned offshore wind projects without the NY Bight projects, and other offshore wind projects in combination with the NY Bight projects are provided on BOEM's NY Bight website: https://www.boem.gov/renewable-energy/state-activities/new-york-bight.

The demarcation line between seascape and open ocean is the U.S. states jurisdictional boundary, 3 nautical miles (nm) (3.45 statute miles [5.5 kilometers]) seaward from the coastline (U.S. Congress Submerged Lands Act, 1953). This line coincides with the area of sea visible from the shoreline. The line defining the separation of seascape and landscape is based on the juxtaposition of apparent seacoast and landward landscape elements, including topography, water (bays and estuaries), vegetation, and structures.

H.2 Method of Analysis

The SLVIA has two separate but linked parts: the open ocean, seascape, and landscape impact assessment (SLIA) and the visual impact analysis (VIA). The SLIA analyzes and evaluates the *sensitivity* of the receptor and the *magnitude of change* in consideration of impacts on both the physical elements and features that make up a landscape, seascape, or open ocean. The VIA analyzes and evaluates the impacts on people from adding the proposed development to views from selected viewpoints.

The inclusion of both the SLIA and VIA in the BOEM SLVIA methodology is consistent with the National Environmental Policy Act's (NEPA) objective of providing Americans with aesthetically and culturally pleasing surroundings and its requirement to consider all potentially significant impacts of development.

H.2.1 SLIA Methodology

The SLIA inventories and describes the visual character of the ocean and the coastal landscape and seascape. It analyzes and evaluates the magnitude of change and the sensitivity of the receptor in consideration of impacts on both the physical elements and features that make up the open ocean, seascape, or landscape. The magnitude of change depends on a project's scale or degree of change, geographic extent, and duration and reversibility.

Sensitivity is measured by the impact receptor's susceptibility to change, its ability to accommodate the impacts of a proposed project without changing its basic character, and its perceived value to society. These impacts affect the "feel," "character," or "sense of place" of an area of open ocean, seascape, or landscape, rather than the composition of a view from a particular place. Social value is based on the aesthetic, perceptual, and experiential aspects of the landscape, seascape, or open ocean that make it distinctive. In the SLIA, the impact receptors (the entities that are potentially affected by the proposed project) are the open ocean/seascape/landscape itself and its components, both its physical features and its distinctive character.

H.2.2 VIA Methodology

The VIA analyzes and evaluates the impacts on people of adding the proposed development to views from selected viewpoints. It also evaluates the change to the composition of the view itself and assesses how the people who are likely to be at that viewpoint may be affected by the change to the view. Enjoyment of a particular view is dependent on the viewer, and, in the VIA, the impact receptors are people.

The VIA for an offshore wind project assesses the impacts of adding the proposed development to views from selected viewpoints (referred to as key observation points or KOPs). The VIA assesses how the change to the view itself caused by the addition of the wind energy project components, such as seeing wind turbines instead of an open ocean horizon, affects people who are likely to be at the viewpoint. The change to the view as a result of adding the proposed project may affect viewers' experience of that particular view. How the addition of the project to the view affects the viewers' experiences and their responses depends in part on who they are, what they are doing when viewing the facility, and how much they value the view. The experience of a particular view is dependent on the viewers, and, as noted, in the VIA, the impact receptors are people, rather than the seascape or landscape itself.

H.2.3 Project Visibility Factors

WTG visibility would be variable throughout the day depending on many factors. View angle, sun angle, and atmospheric conditions would affect the WTG visibility. Visual contrast of WTGs would vary throughout the day depending on the visual character of the horizon's backdrop and whether the WTGs are backlit, side-lit, or front-lit. If less visual contrast is apparent in the morning hours, then it is likely that the visual contrast may be more pronounced in the afternoon. The inverse is possible as well. These effects are also influenced by varying atmospheric conditions, direction of view, distance between the viewer and the WTGs, and elevation of the viewer.

At closer distances, approximately 16 miles (26 kilometers) or closer, the form of the 1,312-foot (400-meter) WTG may be the dominant visual element creating the visual contrast regardless of color. At approximately 12 miles (19 kilometers) or closer the form of the 853-foot (260-meter) WTG may be the dominant visual element creating contrast regardless of color. At greater distances, color may become the dominant visual element creating visual contrast under certain visual conditions that gives visual definition to the WTG's form and line. As the elevation of the viewer increases, earth curvature (EC) has a decreasing effect on the visible height of individual WTGs, allowing a greater proportion of the turbine infrastructure to be seen.

The noticeable daytime and nighttime elements of the project's WTGs and OSSs and their viewshed distances are listed in Table H-1 for 1,312-foot (400-meter) WTGs and in for 853-foot (260-meter) WTGs. Each WTG would have two L-864 flashing red obstruction lights at the top of the nacelle, one of which is required to be lit (BOEM 2021). WTGs would have additional intermediate lighting on the tower utilizing low-intensity red flashing (L-810) obstruction lighting. Line-of-sight calculations for onshore viewers (5.9-foot [1.8-meter] eye level) are based on intervening EC screening (7.98-inch [20.3-centimeter] height per mile). Heights of WTG and OSS components are stated relative to mean lower low water and highest astronomical tide.

Table H-2 and Table H-3 for 1,312-foot (400-meter) WTGs and Table H-5 and Table H-6 for 853-foot (260-meter) WTGs indicate the NY Bight projects' effects based on horizontal and vertical FOV, respectively, defined as the extent of the observable landscape seen at any given moment, usually measured in degrees (BOEM 2021). The horizontal FOV for each KOP is listed in Argonne (2024). FOVs are valid and reliable indicators of the magnitude of view occupation by NY Bight project facilities.

Table H-1. Heights of noticeable[1] 1,312-foot WTG elements and OSS, and visible distances[2]

Noticeable Element[1]	Height in Feet (Meters)	Visible Distance[2] in Miles (Kilometers)
Rotor Blade Tip	1,312 (400) MLLW	0–47.4 (76.3)
Upper Aviation Light	728 (221.9) MLLW	0-36.1 (58.1)
Nacelle	718 (218.8) MLLW	0-35.8 (57.6)
Hub	706 (215.2) MLLW	0-35.6 (57.3)
Mid-tower Navigation Light	353 (107.6) MLLW	0-26.0 (41.8)
OSS	295.3 (90.0) HAT	0–24.1 (38.9)
Yellow Tower Base Color	50 (15.2) HAT	0–11.5 (18.5)

[1] Perception of project elements, from 5.9 feet (1.8 meters) human eye-level while standing at mean sea level, involves static distance-related sizes, forms, lines, colors, and textures; variable daytime lighting conditions; variable nighttime light conditions; and variable meteorological conditions.
[2] Based on intervening EC and clear-day conditions.
HAT = highest astronomical tide; MLLW = mean lower low water

Table H-2. Horizontal FOV occupied by the 1,312-foot WTGs

State	Noticeable Element	Width[1] Miles (Kilometers)	Distance[2] Miles (Kilometers)	Horizontal FOV	Human FOV	Percent of FOV
New York	Wind turbine array	28.9 (46.5)	23.6 (38.0)	50°	124°	40%
New Jersey	Wind turbine array	46.7 (75.1)	30.7 (49.4)	57°	124°	46%

[1] Maximum extent of the visible wind turbine array.
[2] Nearest onshore distance to the wind turbine array: Atlantique Beach, New York, and Long Island Beach, New Jersey.

Table H-3. Vertical FOV occupied by the 1,312-foot WTGs

State	Noticeable Element	Height Feet (meters)	Distance Miles (Kilometers)	Height Above Horizon[1] Feet (Meters)	Vertical FOV	Human FOV	Percent of FOV
New York	Rotor Blade Tip	1,312 (400.0) MLLW	23.6 (38.0)	1,036.5 (311.5)	0.48°	55°	0.8 %
New Jersey	Rotor Blade Tip	1,312 (400.0) MLLW	30.7 (49.4)	799.4 (311.5)	0.28°	55°	0.5 %

[1] Based on intervening EC, clear-day, and clear-night conditions.
MLLW = mean lower low water

Table H-4. Heights of noticeable[1] 853-foot WTG elements and OSS, and visible distances[2]

Noticeable Element[1]	Height in Feet (Meters)	Visible Distance[2] in Miles (Kilometers)
Rotor Blade Tip	853 (260.0) MLLW	0–38.7 (62.3)
Aviation Light	513 (156.4) MLLW	0–30.8 (49.6)
Nacelle	503 (153.3) MLLW	0–30.5 (49.1)
Hub	492 (150.0) MLLW	0–30.2 (48.6)
OSS	295.3 (90.0) HAT	0–24.1 (38.7)
Mid-tower Navigation Light	246 (75.0) MLLW	0–22.2 (35.7)
Yellow Tower Base Color	50 (15.2) HAT	0–11.5 (18.5)

[1] Perception of project elements, from 5.9 feet (1.8 meters) human eye-level while standing at mean sea level, involves static distance-related sizes, forms, lines, colors, and textures; variable daytime lighting conditions; variable nighttime light conditions; and variable meteorological conditions.
[2] Based on intervening EC and clear-day conditions.
HAT = highest astronomical tide; MLLW = mean lower low water

Table H-5. Horizontal FOV occupied by the 853-foot WTGs

State	Noticeable Element	Width[1] Miles (Kilometers)	Distance[2] Miles (Kilometers)	Horizontal FOV	Human FOV	Percent of FOV
New York	Wind turbine array	19.0 (30.6)	23.6 (38.0)	39°	124°	31%
New Jersey	Wind turbine array	23.9 (38.5)	30.7 (49.4)	38°	124°	31%

[1] Maximum extent of the visible wind turbine array.
[2] Nearest onshore distance to the wind turbine array: Atlantique Beach, New York, and Long Island Beach, New Jersey.

Table H-6. Vertical FOV occupied by the 853-foot WTGs

State	Noticeable Element	Height Feet (meters)	Distance Miles (Kilometers)	Height Above Horizon[1] Feet (Meters)	Vertical FOV	Human FOV	Percent of FOV
New York	Rotor Blade Tip	853 (260.0) MLLW	23.6 (38.0)	577.5 (176.0)	0.27°	55°	0.4%
New Jersey	Rotor Blade Tip	853 (260.0) MLLW	30.7 (49.4)	340.4 (103.7)	0.12°	55°	0.2%

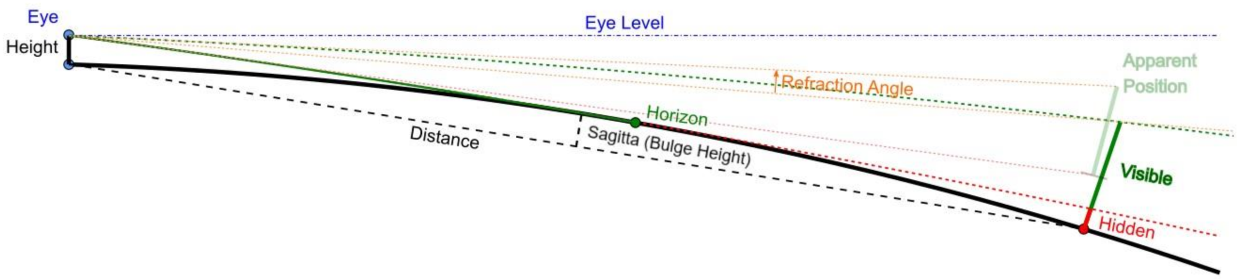
[1] Based on intervening EC, clear-day, and clear-night conditions.
MLLW = mean lower low water

While the coastal shoreline has a prevailing eastward viewing direction, localized views may vary from southeast to northeast. All cardinal directions are conceivable when viewing from a lighthouse or a water vessel at sea. When viewing from onshore toward a southerly direction and scanning to the east and west, the color of the horizon backdrop often will vary. Variation will continue as the sun arcs across the sky from sunrise to sunset. Depending on sun angle, the backdrop sky color may have various intensities of white to gray and sky blue to pale blue to dark blue-gray. Partly cloudy to overcast conditions will also influence the color make-up of the horizon's backdrop. The sunrise and sunset have varying degrees of light blue to dark blue, light and dark purples intermixed with oranges, yellows, and reds. Partly cloudy skies may increase the remarkable color effects during the sunset and sunrise periods of the day.

When placing WTGs offshore, the visual interplay and contrasting elements in form, line, color, and texture may vary with the ever-changing character of the backdrop. Front-lit WTGs may have strong color contrast against a darker gray sky, giving definition to the WTG's vertical form and line contrast to the ocean's horizontal character and the line where the sea meets sky, or visually dissipates against a whiter backdrop created by high levels of evaporative atmospheric moisture during clear sunny days. Partly cloudy skies may create varying degrees of sunlight reflecting off the white wind turbines, placing some WTGs in the shadow and making them appear a darker gray and less conspicuous while highlighting others with a bright white color contrast. The level of noticeability would be directly proportional to the degree of visual contrast and scale of change between the WTGs and the corresponding backdrop. Visual simulations prepared of the NY Bight projects depict both maximum visibility, illustrating no atmospheric haze, and predicted visibility, depicting visibility with the atmospheric conditions on the day the photograph was taken. These variations through the course of the day may result in periods of moderate to major visual effects while at other times of day would have minor or negligible effects.

WTG blade motion also affects visibility. Empirical studies of offshore wind turbine visibility have shown that WTG blade movement is routinely visible at distances of 21 miles (34 kilometers) or less and as far as 26 miles (42 kilometers) (Sullivan et al. 2013). In a visually empty seascape, the rotational movement of the turbines can dominate the scene during the day. Contrary to static turbine noticeability, blade motion is visible regardless of lighting conditions, sun angle, and sky contrast levels. Blade motion contributes substantially to visual contrast and may contribute relatively more at shorter viewing distances (Sullivan 2013). Blade movement noticeability would be dependent on meteorological conditions. It is critical to note that the studies cited above were conducted on smaller WTGs than those considered for the NY Bight projects in the NY Bight Programmatic Environmental Impact Statement [PEIS] or other offshore wind projects along the U.S. eastern seaboard; therefore, noticeability distances would increase with larger wind turbines.

Atmospheric refraction of light rays causes fluctuations in the extents and appearances of offshore and onshore facilities. It results from the bending of light rays between viewers and objects due to current air temperature, water vapor, and barometric pressure (Bislins 2022). Atmospheric refraction can increase the visibility of objects, making them look larger or taller, depending on conditions, as depicted in Figure H-1. Table H-7 provides a summary of increased visibility ranges for the nearest beach viewers for each lease area and both turbine sizes based on the average sea level refraction calculation coefficient of 0.17 (Bislins 2022) applied to the turbine blade tip viewshed distances. Daytime and nighttime atmospheric refraction-based visibility varies with sea level's continuous increases and decreases in temperature, water vapor, and barometric pressure.



Source: Bislins 2022

Figure H-1. Effects of atmospheric refraction and earth curvature on WTG visibility

Table H-7. Atmospheric refraction summary for all lease areas for 1,312-foot and 853-foot WTGs

Lease Area	1,312-Foot WTG		853-Foot WTG	
	Rotor Blade Tip Increased Visibility Feet (Meters)	Nearest Beach Increased Visibility Feet (Meters)	Rotor Blade Tip Increased Visibility Feet (Meters)	Nearest Beach Increased Visibility Feet (Meters)
OCS-A 0537	From 0.0 to 233.8 (71.3) = 233.8 (71.3)	From 167 (50.9) to 375 (114.3) = 208 (63.4)	From 0.0 to 158 (48.2) = 158 (48.2)	Not visible
OCS-A 0538	From 0.0 to 233.8 (71.3) = 233.8 (71.3)	From 296 (90.2) to 482 (146.9) = 186 (56.7)	From 0.0 to 158 (48.2) = 158 (48.2)	From 0 to 26.8 (43.1) = 26.8 (43.1)
OCS-A 0539	From 0.0 to 233.8 (71.3) = 233.8 (71.3)	From 535 (163.1) to 678 (206.7) = 143 (43.6)	From 0.0 to 158 (48.2) = 158 (48.2)	From 94.5 (152.1) to 234.3 (377.1) = 139.8 (225)
OCS-A 0541	From 0.0 to 233.8 (71.3) = 233.8 (71.3)	From 799 (243.5) to 895 (272.8) = 96 (29.3)	From 0.0 to 158 (48.2) = 158 (48.2)	From 340 (103.6) to 436 (132.9) = 96 (29.3)
OCS-A 0542	From 0.0 to 233.8 (71.3) = 233.8 (71.3)	From 615 (187.5) to 744 (226.8) = 129 (42.3)	From 0.0 to 158 (48.2) = 158 (48.2)	From 0.0 to 69.1 (111.0) = 69.1 (111.0)
OCS-A 0544	From 0.0 to 233.8 (71.3) = 233.8 (71.3)	From 1,028 (313.3) to 1,083 (330.1) = 55 (16.8)	From 0.0 to 158 (48.2) = 158 (48.2)	From 569 (173.4) to 624 (190.2) = 55 (16.8)

Visibility thresholds have been described and rated through research by Robert Sullivan at Argonne based on WTGs in England. Table H-8 describes visibility threshold levels and ratings based on this work. This research, along with distance and observer elevation considerations, informed by the visual simulations, EC calculations, horizontal FOV, and vertical FOV in undeveloped open ocean provide the basis for evaluating visibility.

Table H-8. Visibility threshold levels

Visibility Rating	Description
Visibility level 1. Visible only after extended, close viewing; otherwise, invisible.	An object/phenomenon that is near the extreme limit of visibility. It could not be seen by a person who was unaware of it in advance and looking for it. Even under those circumstances, the object can be seen only after looking at it closely for an extended period.
Visibility level 2. Visible when scanning in the general direction of the subject; otherwise, likely to be missed by casual observers.	An object/phenomenon that is very small and/or faint, but when the observer is scanning the horizon or looking more closely at an area, can be detected without extended viewing. It could sometimes be noticed by casual observers; however, most people would not notice it without some active looking.
Visibility level 3. Visible after a brief glance in the general direction of the study subject and unlikely to be missed by casual observers.	An object/phenomenon that can be easily detected after a brief look and would be visible to most casual observers, but without sufficient size or contrast to compete with major landscape/seascape elements.
Visibility level 4. Plainly visible, so could not be missed by casual observers, but does not strongly attract visual attention or dominate the view because of its apparent size, for views in the general direction of the study subject.	An object/phenomenon that is obvious and with sufficient size or contrast to compete with other landscape/seascape elements, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of an observer's visual field.
Visibility level 5. Strongly attracts the visual attention of views in the general direction of the study subject. Attention may be drawn to the strong contrast in form, line, color, or texture, luminance, or motion.	An object/phenomenon that is not large but contrasts with the surrounding landscape elements so strongly that it is a major focus of visual attention, drawing viewer attention immediately and tending to hold attention. Has strong contrasts in form, line, color, and texture. In addition, bright light sources and moving objects contribute substantially to drawing viewer attention. The study subject's visual prominence noticeably interferes with views of nearby landscape/seascape elements.
Visibility level 6. Dominates the view because the study subject fills most of the visual field of views in its general direction. Strong contrasts in form, line, color, texture, luminance, or motions may contribute to view dominance.	An object/phenomenon with strong visual contrasts that is so large it occupies most of the visual field, and views cannot be avoided except by turning one's head more than 45 degrees from a direct view of the object. The phenomenon is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. The study subject's visual prominence noticeably detracts from views of other landscape/seascape elements.

Source: Sullivan et. al 2013.

H.2.4 Geographic Scope

As described in Section 3.6.9, *Scenic and Visual Resources,* of the PEIS, the scenic and visual resources geographic analysis area extends approximately 47.4 miles (76.3 kilometers) offshore and 50 miles (80.5 kilometers) onshore to capture potential views of the NY Bight projects, and includes the coastlines from Atlantic City, New Jersey, to the Shinnecock Indian Nation in Long Island, New York, as well as elevated viewpoints of national significance (e.g., Empire State Building) (Argonne 2024).

H.2.5 Defining Potential Impacts

Project activities for all stages of the project life cycle (construction and installation, operations and maintenance [O&M], and decommissioning) are assessed against the environmental baseline to identify the potential interactions between a project and the seascape, landscape, and viewers. Analysis of visual impacts for the onshore geographic analysis area should include an assessment of landfalls, buried onshore export cables, onshore substation/converter station, and transmission connections to the electric grid. Because the locations of onshore infrastructure for the NY Bight projects are currently unknown, this assessment only analyzes impacts from offshore structures. Visual impacts from onshore infrastructure will be analyzed during the project-specific NEPA review for each Construction and Operations Plan (COP). Potential impacts from offshore infrastructure are assessed to determine an impact level consistent with the definitions in Table H-9.

Table H-9. Definitions of potential adverse impact levels for SLIA and VIA

Impact Level	Impact Type	Definition
Negligible	Adverse	**SLIA**: Very little or no effect on seascape/landscape unit character, features, elements, or key qualities either because unit lacks distinctive character, features, elements, or key qualities; values for these are low; or project visibility would be minimal. **VIA**: Very little or no effect on viewers' visual experience because view value is low, viewers are relatively insensitive to view changes, or project visibility would be minimal.
Minor	Adverse	**SLIA**: The project would introduce features that may have low to medium levels of visual prominence within the geographic area of an ocean/seascape/landscape character unit. The project features may introduce a visual character that is slightly inconsistent with the character of the unit, which may have minor to medium negative effects on the unit's features, elements, or key qualities, but the unit's features, elements, or key qualities have low susceptibility or value. **VIA**: The visibility of the project would introduce a small but noticeable to medium level of change to the view's character; have a low to medium level of visual prominence that attracts but may or may not hold the viewer's attention; and have a small to medium effect on the viewer's experience. The viewer receptor sensitivity/susceptibility/value is low. If the value, susceptibility, and viewer concern for change is medium or high, then evaluate the nature of the sensitivity to determine if elevating the impact to the next level is justified. For instance, a KOP with a low magnitude of change, but that has a high level of viewer concern (combination of susceptibility/value), may justify adjusting to a moderate level of impact.
Moderate	Adverse	**SLIA**: The project would introduce features that would have medium to large levels of visual prominence within the geographic area of an ocean/seascape/landscape character unit. The project would introduce a visual character that is inconsistent with the character of the unit, which may have a moderate negative effect on the unit's features, elements, or the key qualities. In areas affected by large magnitudes of change, the unit's features, elements or key qualities have low susceptibility and/or value. **VIA:** The visibility of the project would introduce a moderate to large level of change to the view's character, may have a moderate to large level of visual prominence that attracts and holds but may or may not dominate the viewer's attention, and has a moderate effect on the viewer's visual experience. The viewer receptor sensitivity/susceptibility/value is medium to low. Moderate impacts are typically

Impact Level	Impact Type	Definition
		associated with medium viewer receptor sensitivity (combination of susceptibility/value) in areas where the view's character has medium levels of change, or low viewer receptor sensitivity (combination of susceptibility/value) in areas where the view's character has large changes to the character. If the value, susceptibility, and viewer concern for change is high, then evaluate the nature of the sensitivity to determine if elevating the impact to the next level is justified.
Major	Adverse	**SLIA:** The project would introduce features that would have dominant levels of visual prominence within the geographic area of an ocean/seascape/landscape character unit. The project would introduce a visual character that is inconsistent with the character of the unit, which may have a major negative effect on the unit's features, elements, or key qualities. The concern for change (combination of susceptibility/value) to the character unit is high. **VIA:** The visibility of the project would introduce a major level of character change to the view; will attract, hold, and dominate the viewer's attention; and have a moderate to major effect on the viewer's visual experience. The viewer receptor sensitivity/susceptibility/value is medium to high. If the magnitude of change to the view's character is medium, but the susceptibility or value at the KOP is high, then evaluate the nature of the sensitivity to determine if elevating the impact to major is justified. If the sensitivity (combination of susceptibility/value) at the KOP is low in an area where the magnitude of change is large, then evaluate the nature of the sensitivity to determine if lowering the impact to moderate is justified.

H.2.6 Laws, Ordinances, and Regulations

Open ocean, seascape, landscape, and visual resource protection and management laws, ordinances, and regulations are identified in Table H-10.

Table H-10. Laws, Ordinances, and Regulations

Jurisdiction	Authority	Objectives
Federal		
BOEM	Code of Federal Regulations (CFR) Title 30 of the CFR Part 585, Subpart F, Plans and Information Requirements	This title provides guidance on survey requirements, project-specific information, and information to meet the requirements of the Outer Continental Shelf Lands Act, NEPA, and other applicable laws and regulations. It also specifies that to comply with NEPA and other relevant laws, the COP must include a detailed description of visual resources and various social and economic resources that could be affected by the proposed project, that would be addressed in an SLVIA.
BOEM	Outer Continental Shelf Lands Act (OCSLA), Title 43, Chapter 29, Subchapter I, Section 1301 (1953)	The primary purpose of the OCSLA is to facilitate the federal government's leasing of its offshore mineral resources and energy resources. As set forth in the Energy Policy Act of 2005, OCSLA was amended to authorize the Department of the Interior (DOI) to issue submerged land leases for alternate uses and alternative energy development on the OCS. Through this amendment and subsequent delegation by the Secretary of the Interior, BOEM has the authority to issue these leases and regulate activities that occur within them, including the authorization of a COP.

Jurisdiction	Authority	Objectives
BOEM	Submerged Lands Act (SLA) of 1953	The SLA grants coastal states title to natural resources located within their coastal submerged lands out to 3 miles (4.8 kilometers) from their coastline.
BOEM	National Environmental Policy Act (NEPA)	NEPA was signed into law in 1970 and set forth a national environmental policy in the United States meant to ensure federal agencies consider the significant environmental consequences of their proposed actions and inform the public about their decision making. NEPA established the Council on Environmental Quality (CEQ) to advise agencies on the NEPA process and to oversee and coordinate the development of federal environmental policy. The CEQ issued revised NEPA regulations (40 CFR 1500-1508) in 2021. The regulations include procedures to be used by federal agencies for the NEPA review process.
BOEM	Clean Air Act (CAA) of 1970	The CAA authorized the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The states were directed to develop State Implementation Plans (SIPs), which consist of emission reduction strategies, with the goal of achieving the NAAQS by the legislated date. BOEM has jurisdiction over OCS air emissions in the Gulf of Mexico west of 87.5 degrees west longitude (off the coasts of Texas, Louisiana, Mississippi, and Alabama). BOEM also has jurisdiction over OCS air emissions within the Chukchi and Beaufort Seas in Alaska according to the Consolidated Appropriations Act of 2012. In all other OCS areas, the USEPA has jurisdiction, as mandated by Section 328 of the CAA.
BOEM	Coastal Zone Management Act (CZMA) (1972)	The U.S. Congress recognized the growth in the coastal zone by passing the CZMA, which is administered by the National Oceanic and Atmospheric Administration (NOAA). The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." Authorized by the CZMA in 1972, the Coastal Zone Management Program (CZMP) was established as a voluntary partnership between the federal government and U.S. coastal and Great Lakes states and territories (BOEM 2009).
BOEM	National Historic Preservation Act 1966	This act establishes a preservation program and a system of protections, which encourages both the identification and protection of historic resources. As part of this program, historic districts and individual properties are either listed or eligible for listing on the National Register of Historic Places (NRHP) or National Historic Landmarks (NHL).
BOEM	Inflation Reduction Act of 2022	This act offers funding, programs, and incentives to accelerate the transition to a clean energy economy and will likely drive significant deployment of new clean electricity resources. The act's incentives reduce renewable energy costs for organizations, businesses, nonprofits, educational institutions, and state, local, and tribal organizations. Taking advantage of Inflation Reduction Act incentives, such as tax credits, is key to lowering greenhouse gas emission footprints and accelerating the clean energy transition.

Jurisdiction	Authority	Objectives
BOEM	Information Guidelines for a Renewable Energy Construction and Operations Plan (COP). Version 4.0. (BOEM 2020)	BOEM's guidelines indicate that the visual resource assessment should apply appropriate viewshed mapping, photo simulations, and field inventory techniques to determine the visibility of the proposed project at scenic viewpoints.
BOEM	Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States (2021)	This OCS Study provides the methodology for assessing the seascape, landscape, and visual impacts of offshore wind within a particular study area. Developers are to use this guidance in preparation as part of a COP for their lease development. This assessment is to be reviewed by BOEM.
State of New York		
New York State Department of State (NYSDOS)	New York State Coastal Management Program and Final Environmental Impact Statement (NYSDOC 2017)	Policy 24: Prevent impairment of scenic resources of statewide significance. Policy 25: Protect, restore, or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.
New York State Department of Environmental Conservation (NYSDEC)	NYSDEC Policy DEP-00-2: Assessing and Mitigating Visual and Aesthetic Impacts	The purpose of this policy is to guide the evaluation of visual impacts for proposed projects as they relate to scenic and aesthetic resources of statewide significance.
New York State Department of State (NYSDOS)	Long Island Sound Coastal Management Program (LIS CMP) (1999) (NYSDOS 1999)	Policy 3: Enhance visual quality and protect scenic resources throughout Long Island Sound. The LIS CMP provides a recommendation to protect scenic resources within the Long Island Sound coastal region by having the NYSDOS and local government undertake a comprehensive scenic resources evaluation of the Long Island Sound Coastal Area and prepare appropriate area designations. This would include scenic areas of statewide significance (SASS). Another recommendation is to identify, preserve, and provide access to regionally important vistas. The NYSDOS proposed to evaluate scenic land and water vistas as part of the SASS Program (Executive Law, Article 42 and 19 NYCRR Part 602.5c). The NYSDOS will also work with Local Waterfront Revitalization Programs to identify locations for protection and enhancement of visual access.
South Shore Estuary Reserve	Long Island South Shore Estuary Reserve Comprehensive Management Plan (CMP) 2022	Originally implemented in 2001, The Long Island South Shore Estuary Reserve CMP is the result of The Long Island South Shore Estuary Reserve Act passed in 1993 creating the Long Island South Shore Estuary Reserve (Reserve). The act also implemented the Long Island South Shore Estuary Reserve Act Council (Council) whose task was to design a CMP to protect the reserve and its inhabitants. This CMP emphasizes the importance of the Long

Jurisdiction	Authority	Objectives
		Island South Shore Estuary Ecosystem and outlines actions necessary to preserve, protect, and enhance the natural, recreational, economic, aesthetic, and educational resources that the reserve provides. The CMP discusses various components, such as: • Action 2.3.8: Reduce negative environmental consequences of duck sludge and other legacy pollutants through removal and/or restoration. The restoration of former duck farms represents an important opportunity to improve aesthetic and environmental conditions for nearby neighborhoods and provide County residents with the opportunity to access these waterways for recreational and educational purposes. • Action 4.3.4: Increase end-of-street parks and parking access to the shoreline. Implement projects that create parks at the end of streets and in vacant lots, provide public parking access, and provide benefits such as improved aesthetics and public access. Parks that utilize green infrastructure best management practices can also contribute to water quality improvement.
New York City, New York		
New York City Planning (NYCP)	New York City Waterfront Revitalization Program (WRP) (2016)	The WRP establishes New York City's policies for waterfront planning, preservation, and development projects to ensure consistency over the long term. The goal of the WRP is to maximize the benefits derived from economic development, environmental conservation, and public use of the waterfront, while minimizing any potential conflicts among these objectives (NYCP 2016). The WRP includes policies that are intended to protect and enhance scenic resources: • Policy 9: Protect scenic resources that contribute to the visual quality of the New York City coastal area. • Policy 9.1: Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront. • Policy 9.2: Protect and enhance scenic values associated with natural resources.
New York City Department of City Planning	New York City Comprehensive Waterfront Plan (2021)	This plan, updated every 10 years, puts forth new strategies for an equitable, resilient and healthy waterfront in the face of climate change. Goal 1: Expand public access to the waterfront with an emphasis on equity by bridging access gaps in historically underserved areas and supporting growing waterfront communities. An important part of this goal is visual access. Clear, unobstructed sightlines down to the waterfront expand connectivity. Visual corridors typically overlap with streets and other upland connections to guide people safely to the water. Where physical access to the water cannot be achieved immediately, visual connectivity can provide communities with an opportunity to see and engage with their waterfronts and form a meaningful connection.

Jurisdiction	Authority	Objectives
Suffolk County, New York		
Suffolk County	Suffolk County Comprehensive Master Plan 2035 (Suffolk County Department of Economic Development and Planning 2023)	The vision of the 2035 Plan is captured by three themes: Revitalize, Rebuild, and Reclaim, i.e., revitalize the economy; rebuild the downtowns and infrastructure; and reclaim the quality of the groundwater, surface water and terrestrial resources. The Master Plan discusses the importance of the rural water setting of Suffolk County that attracts visitors who enjoy bathing beaches, fishing, boating, and other water sports as well as hiking, bicycling, adventure tourism, and other outdoor recreation or simply viewing the scenery and historic hamlets.
Babylon, Town of	2020-2024 Consolidated Plan & 2020 Annual Action Plan (2020)	No specific objectives are included within the plan for protecting or improving scenic views, nor beach/waterfront views.
Brookhaven, Town of	Local Waterfront Revitalization Program (Anticipated Completion Date of August 2023) (Town of Brookhaven 2023)	The Local Waterfront Revitalization Program will provide strategies and identify projects that improve public access, establish connections between downtown and the waterfront, modify local codes and ordinances to remove barriers to sustainable development, and incorporate sea level rise projections and resiliency measures into community planning.
Islip, Town of	None identified	The Town of Islip is in the process of creating a Comprehensive Plan.
Southampton, Town of	Town of Southampton Coastal Resources & Water Protection Plan (2016)	The plan describes the community's scenic resources as follows: "Southampton's unique scenic quality and sense of place is derived from the interplay of rural farmland, areas of undeveloped open space, water frontage (bay, ocean) and the hamlet centers. This rural character graces the Town with significant natural and historic resources. It is this quality that maintains the Town's vitality as a resort, second home and visitor attraction, as well as an attractive place to live and work." The Plan presents the different visual resources found within the town, including natural environments, built environments, historic vistas, and recognized areas of high scenic quality.
Nassau County, New York		
Nassau County	Nassau County Master Plan (2010)	The Nassau County Master Plan's goals are centered around a framework that helps shape the county's jobs, places, and infrastructure. Economic development is to be enhanced by strengthening downtowns, revitalizing underutilized commercial properties, and redeveloping brownfields to preserve the quality of life for residents by protecting environmental, scenic, and historic resources. Within the Master Plan, sections are dedicated to the importance of historic and cultural assets, along with the sustainable land use development and waterfront and coastal zones. The plan addresses the county's variety of historic, cultural, and scenic resources in addition to the environmental resources Nassau County has to offer.

Jurisdiction	Authority	Objectives
Long Beach City	Comprehensive Plan 2022–2023 (draft)	The 2023 Comprehensive Plan outlines the city's values, visions, and goals for the next 15 years. One of the city's goals is to enhance the physical attributes of all commercial districts and areas. This includes improving aesthetics in streetscapes and commercial areas. Increasing public access to the waterfront is an important aspect to the Comprehensive Plan, along with the ability for beaches and dunes for the southern waterfront to provide resiliency, environmental, social, and economic benefits. However, no specific objectives are included in the plan for protecting or improving scenic views, or beach/waterfront views.
Hempstead, Town of	Energy and Sustainability Master Plan (Town of Hempstead 2012)	The implementation of a "green grounds" policy would promote greener and more cost-effective maintenance and operations strategies. This is important as the demand for high quality public-use landscapes has increased. The "green grounds" policy would not compromise the visual landscape quality. There is no town master plan or specifics discussed in the plan referenced about the preservation of scenic views.
Oyster Bay, Town of	Town of Oyster Bay: Open Space Preservation Plan (South Shore Estuary Reserve Workplan Implementation) (2010)	Scenic value is identified in the Open Space Preservation Plan as an important factor in identifying open space and resource protection.
State of New Jersey		
New Jersey Coastal Management Program	Section 309 Assessment and Strategy (2021-2025)	Section 309 Enhancement Objective: Attain increased opportunities for public access, considering current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.
New Jersey Department of Environmental Protection	Green Acres Program (2023)	The mission of this program is "to achieve, in partnership with others, a system of interconnected open spaces, the protection of which will preserve and enhance New Jersey's natural environment and its historic, scenic, and recreational resources for public use and enjoyment."
State Historic Preservation Office	New Jersey State Register of Historic Places	The geographic analysis area contains additional historic resources that the state has determined are worthy of preservation, but which have either not been determined eligible for inclusion or have not been evaluated for listing in the NRHP.
Atlantic County, New Jersey		
Atlantic County	Atlantic County, New Jersey Master Plan (2018); Atlantic County, New Jersey Open Space and Recreation Plan (2018)	The Master Plan includes a goal to preserve and protect resources, environmentally sensitive areas, particularly watersheds, recharge areas, threatened and endangered species habitat, scenic view sheds, and other valuable features. The Pine Barrens Byway is located partially within the county and includes a variety of historic and scenic sites. There are no specific objectives to preserve and protect scenic views from within the community or the ocean/beach areas. The Open Space and Recreation Plan defines open space as consisting of "diverse environments such as forests, fields, meadows, lakes, ponds, beaches, rivers, streams, historic sites and structures, scenic views and corridors, athletic

Jurisdiction	Authority	Objectives
		fields, gardens, orchards, farmland, and vacant lots." No specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.
Absecon, City of	2016 Reexamination Report (2017)	The need to develop and implement programs and regulatory controls to protect scenic resources is identified in the reexamination report, specifically pertaining to residential structures along the Shore Road Corridor and adjacent streets. The report introduces recommendations for historic preservation. No specific objectives are included within the report for protecting or improving scenic views, or beach/waterfront views.
Atlantic City	Atlantic City Master Plan (2008); Master Plan Reexamination Report (2016)	An objective under the Open Space and Recreation section of the Master Plan is to preserve and protect open space areas that have scenic views and/or important historical, cultural significance and exceptional ecological value. Gardner's Basin Maritime Park is identified as being the most scenic park in the city as it sits by the water's edge. The Conservation Element section describes tidal marshes to provide grand scenic views of the city's urban skyline due to the flat landscape character. Although areas are identified as being scenic, no specific objectives are included within the Master Plan for protecting or improving scenic views, or beach/waterfront views. The reexamination report does provide specifications.
Brigantine, City of	2016 Master Plan Re-examination Report (2016)	An objective identified from the previous planning documents includes an intent to "implement programs and regulatory controls designed to protect the scenic resources of the community." Zoning controls such as building height restrictions and setbacks have previously been implemented. There is public concern for access to scenic resources due to the development of the waterfront. There is a need to promote and preserve access to the Bay and Atlantic Ocean. A general goal to promote a desirable visual environment through creative development techniques and good civic design and arrangements is in the 2016 General Goals and Objectives Statement section. Provisions are made in subsequent sections to respond to this objective and improve the visual environment through changes to building setbacks, height restrictions, and similar measures. However, no additional measures are proposed to protect or enhance visual access and protect scenic corridors.
Egg Harbor Township	Egg Harbor Township Master Plan (2002); Master Plan Reexamination Report (2017)	The Master Plan wants to provide resource protection by enhancing the natural, cultural and scenic resources of the Great Egg Harbor River (GEHR) and its watershed. The GEHR and its tributaries are described as a scenic resource with many scenic landscapes including lakes, streams, pristine forest areas, and cedar/hardwood swamps. The Pinelands Comprehensive Management Plan designates the lower and middle portions of the river and its tributaries as scenic corridors of "special significance" within the Pinelands. It identifies the need to incorporate resource protection measures and proposes the creation of a River Conservation (RC) overlay zoning district and the establishment of a land use plan that protects river resources. Recommendations for this zoning district include minimizing the

Jurisdiction	Authority	Objectives
		visual impacts of development as seen from the river. The 2017 Reexamination Report has shown no progress in implementing the proposed RC zone overlay and is still a recommendation.
Galloway Township	Master Plan Reexamination Report (2020)	An objective identified from the previous planning documents is to preserve and protect open space areas having scenic views or important historical, cultural, or agricultural significance. Another identified objective is to maintain continuous networks of open spaces along streams, scenic areas, and critical environmental areas. However, no specific objectives are included within the Master Plan for protecting or improving scenic views, or beach/waterfront views.
Linwood City	City of Linwood Master Plan (2002); Master Plan Reexamination Report (2018)	The City of Linwood's goals include preserving the city's historic, scenic, and recreational assets. However, there is no specific mention of the preservation of outward views from within the community, or ocean/beach views. No specific objectives are included within the Master Plan for protecting or improving scenic views, or beach/waterfront views.
Longport, Borough	Municipal Public Access Plan (2020) (Borough of Longport 2020)	This plan lays out the visions for providing access to tidal waters and shorelines. There is no mention of visual or scenic resources; however, the importance for public water access is important in this Borough.
Margate City	2016 Comprehensive Master Plan Update (2017)	This Master Plan is in place to address the city's increased seasonal population by developing plans and strategies for the city to adapt and thrive in the future. One goal is to promote a desirable visual environment through creative development techniques and good civic design and arrangement. A second objective is to establish within the Land Use Plan and Land Development Ordinance, as appropriate, specific architectural design standards to promote a desirable visual environment and ensure the continued visual integrity of both the commercial and residential sections of the city. A goal set forth around waters includes minimizing pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state; protect public health; safeguard fish and aquatic life and scenic and ecological values; and enhance the domestic, municipal, recreational, industrial, and other uses of water.
Pleasantville City	Pleasantville Master Plan Reexamination (2015)	An objective of this plan is to create a conservation zone along the city's eastern boundary where the bay and marine tidal marsh exist so that development is not permittable. However, no specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.
Port Republic City	None identified	
Ventnor City	2016 Master Plan Reexamination (2016) (Ventnor City 2016)	No specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.

Jurisdiction	Authority	Objectives
Burlington County, New Jersey		
Burlington County	Parks and Open Space Master Plan (2002)	An objective of this plan is to identify and preserve areas of significant scenic beauty. This includes roads that provide visual or physical access to extraordinary scenic, cultural, recreational, or natural features. These areas will be submitted to the New Jersey Department of Transportation for designation in accordance with the New Jersey Scenic Byways Program. The plan recommends that the county should work with appropriate staff and outside agencies to identify, map, and develop viewsheds and areas of significant beauty. As a part of the county's goal to advance the county's culture, character, and heritage through development of the county park system, the county plans to erect interpretative signs to promote historic viewsheds. No specific objectives are included for protecting or improving beach/waterfront views.
Bass River Township	None identified	
Cape May County, New Jersey		
Cape May County	Cape May County Open Space and Recreation Plan (2007); Comprehensive Plan (2022)	One goal of the Cape May County Open Space and Recreation Plan is to protect and preserve natural and scenic resources. However, there are no specific objectives for protecting or improving scenic views, or beach/waterfront views. The Comprehensive Plan also does not include objectives for protecting or improving scenic views, or beach/waterfront views.
Ocean City	City of Ocean City Master Plan (1988); Ocean City Open Space & Recreation Plan (2014); Master Plan Reexamination Report (2019); Conservation Plan Element, Environmental Resources and Recreation Inventory (2009)	An objective of the Ocean City Master Plan is to promote a desirable visual environment through creative development techniques with respect to environmental assets and constraints of the overall city and of individual development sites. Another objective is to encourage the preservation and restoration of historically significant buildings and sites within the city. There are development provisions for structures in the waterfront neighborhoods of the city to preserve waterfront views. The Ocean City Open Space and Recreation Plan includes a conservation goal to preserve and maintain the ecological, historical, visual, recreational, and scenic resources of the city. The plan includes guidelines to acquire sites of special scenic value that should be protected to preserve or enhance the character of the community. The goal of the Conservation Plan Element, Environmental Resources and Recreation Inventory is to preserve and maintain the ecological, historic, visual, recreational, and scenic resources of the city. However, there are no objectives for protecting or improving scenic views, or beach/waterfront views. There are also no additional objectives in terms of scenic resources in the Master Plan Reexamination Report.
Monmouth County, New Jersey		
Monmouth County	The Monmouth County Master Plan (2016); 2018 Master Plan Reexamination (2018)	This plan's objectives are to help guide efforts and actions that contribute to a strong, stable, and sustainable prosperity through redevelopment, revitalization, and rediscovery. Relevant objectives of the plan include:

Jurisdiction	Authority	Objectives
		• Protect, conserve, and enhance the county's significant, diverse, natural, and scenic resources utilizing sound ecological protection and restoration measures. • Support investment in the preservation of cultural, historic, and scenic resources located in priority growth areas and locations. • Support retention, preservation, restoration, and improvement of our cultural, historic, and scenic resources that define a community's distinct character. The Reexamination Plan does not mention any changes to the goals pertaining to scenic resources.
Allenhurst Borough	Master Plan Reexamination Report (2018)	The Master Plan references the Coastal Metropolitan Planning Area, within which the Borough falls. One of the objectives of this reference is to encourage the reclamation of environmentally damaged sites and mitigate future negative impacts, particularly for waterfronts, beaches, scenic vistas, and habitats. It also references the State Development and Redevelopment Plan (SDRP) goals, one of which is to preserve and enhance areas with historic, cultural, scenic, open space, and recreation value.
Asbury Park City	Master Plan & Master Plan Reexamination Report (2017)	The Master Plan provides improvement to the lakes in the city that would enhance the public's enjoyment through aesthetic and environmentally healthy improvements of the water and surrounding areas. However, no specific provisions are included for protecting or enhancing the outward views from within the community, or beach/ocean views.
Avon-by-the-Sea Borough	Municipal Public Access Plan (2017)	This plan identifies the boardwalk as an important public access point that provides visual and physical access to the oceanfront. There are five locations along Shark River that are limited to visual access only due to safety concerns.
Belmar Borough	Master Plan Reexamination Report & Update (2016)	One of the four goals of this Master Plan is Preservation and Enhancement of Critical State Resources – Ensure that strategies for growth include preservation of the State's critical natural, agricultural, scenic, recreation, and historic resources, recognizing the roles they play in sustaining and improving the quality of life for New Jersey residents and attracting economic growth.
Bradley Beach Borough	Master Plan Reexamination Report (2018); Recreation, Open Space, and Conservation Element of the Bradley Beach Borough Master Plan; Municipal Public Access Plan (2019)	The Master Plan Reexamination Report addresses land development issues and provides recommendations where necessary. The Recreation, Open Space, and Conservation Plan objective is to provide an inventory of the Borough's existing recreation, open space, and observation facilities and establish goals and objectives to guide enhancement, preservation, and development of these facilities. The Municipal Public Access Plan includes the enhancement of public access to tidal waters and shorelines for recreation, navigation, commerce, and fishing. Recreation activities in this Borough include swimming, sunbathing, fishing, surfing, sport diving, bird watching, walking, and boating along the tidal shores. No specific objectives are included within the three plans for protecting or improving scenic views, or beach/waterfront views.

Jurisdiction	Authority	Objectives
Deal Borough	Municipal Public Access Plan (2017)	This plan not only identifies physical beach access areas in the Borough, but visual access of the beach and ocean for those who choose not to physically access the beaches. Three points of visual access are identified.
Highlands Borough	2016 Master Plan Reexamination Report and Master Plan Amendments (2016)	This plan recognizes the importance of aesthetics in terms of new buildings, and landscape design, streetscapes, and neighborhoods. The land use plan elements include open space preservation and living shorelines. No specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.
Loch Arbour Village	Municipal Public Access Plan (2017)	The Village is responsible for providing public access to the tidal waters. No specific objectives are included within the Access Plan for protecting or improving scenic views, or beach/waterfront views.
Long Branch City	2020 Master Plan Reexamination (2020) Municipal Public Access Plan (2017)	Some goals in the Master Plan include promoting aesthetically pleasing development that recognizes the character of the traditional New Jersey shore towns, preserving the city's natural resources and historically and architecturally significant districts and structures. In the Municipal Public Access Plan, the city supports the reconstruction of the historic Long Branch Pier as a multi-purpose facility. This pier will be open for public use and includes a fishing area, a garden, a children's play area, visual access, and proximity to beach and boardwalk access points. There are 27 public access locations identified as having visual access. Between these two plans, no specific objectives are included for protecting or improving scenic views, or beach/waterfront views.
Manasquan Borough	Master Plan Re-examination (2017)	This plan encourages the development of both active and passive recreation for residents and visitors while maintaining the sensitivity to environmental and cultural resources. No specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.
Middletown Township	Master Plan Reexamination Report & Amended Housing Master Plan Element and Open Space, Recreation and Conservation Master Plan Element	This report discusses the approach to site design that promotes preservation of significant resources, including scenic corridors, historic roadways, architecturally and historically significant structures, and open space. No specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.
Monmouth Beach Borough	Municipal Public Access Plan (2017); Master Plan Reexamination Report and Plan Amendment (2017)	The plan identifies 13 publicly accessible areas that are for visual purposes only of the water. The plan is consistent with Goal #2 of the Monmouth County Comprehensive Master Plan, including to protect, conserve, and enhance the county's significant, diverse, natural, and scenic resources utilizing sound ecological protection and restoration measures. One of the report's goals is to promote aesthetically pleasing human scale development that recognizes the character of traditional New Jersey shore towns. No specific objectives are included within the plan or the report for protecting or improving scenic views, or beach/waterfront views.

Jurisdiction	Authority	Objectives
Neptune Township	The Township of Neptune Comprehensive Master Plan (2011)	The Master Plan provides a framework for development and preservation of the township throughout its scenic, historic, and natural areas. The plan provides goals and recommendations for future development while preserving natural and historic resources. This includes promoting aesthetics in terms of commercial and industrial areas, future utility installations, and the visual quality of scenic corridors. The Fletcher Lake and Wesley Lake corridors will be evaluated for potential designation as scenic corridors and to consider adopting appropriate design standards and guidelines for development along designated corridors. However, no specific objectives are included for protecting or improving beach/waterfront views.
Sea Bright Borough	2017 Sea Bright Borough Master Plan (2017)	This plan notes the importance of conserving the beach and river waterfronts for the value of providing both scenic vistas and recreational opportunities. A policy of the Borough includes promoting visual environment through creative development techniques and good civic design and arrangement.
Sea Girt Borough	Master Plan Reexamination Report (2018)	The Master Plan states the Coastal Area Facilities Review Act policies, including the reclamation of environmentally damaged sites and mitigation of future negative impacts, particularly for waterfronts, beaches, scenic vistas, and habitats. The plan discusses the need for a historic preservation plan. No specific objectives are included for protecting or improving scenic views, or beach/waterfront views.
Spring Lake Borough	Master Plan (2010)	Some of the goals presented in the Master Plan include maintaining historic resources and the natural beauty of the Borough, enhancing conservation, recreational, and open spaces. No specific objectives are included for protecting or improving scenic views, or beach/waterfront views.
Ocean County, New Jersey		
Ocean County	Conservation Plan Element, Environmental Resources and Recreation Inventory (2009); 2011 Comprehensive Master Plan (2011); Open Space, Parks & Recreation Plan (2020)	The Conservation Plan Element's overall goal is to preserve and maintain the ecological, historic, visual, recreational, and scenic resources of the city. However, there are no objectives for protecting or improving scenic views, or beach/waterfront views. The Comprehensive Master Plan and the Open Space, Parks, and Recreation Plan include no objectives for protecting or improving scenic views, or beach/waterfront views.
Barnegat Light Borough	Barnegat Light Borough Master Plan Reexamination (2018)	One goal of the Municipal Public Access Plan (attached to the Master Plan) is to maintain and continue to promote a visually pleasing aesthetic along the waterfront areas. The plan identifies four public access points that are used for visual access only.
Barnegat Township	2011 Barnegat Township Master Plan (2011)	Historic preservation is a valuable asset to the community. By protecting aesthetically attractive architectural elements and utilizing existing infrastructure, historic preservation is essential. Significant sites are often those that already provide the town with open space, recreation, and scenic vistas. Referencing the

Jurisdiction	Authority	Objectives
		State Development and Redevelopment Plan, the Borough will preserve and enhance historic, cultural, scenic, open space, and recreational value. However, no specific objectives are included within the plan for protecting or improving scenic views, or beach/waterfront views.
Bay Head Borough	Municipal Public Access Plan (2020); Master Plan Reexamination Report and Update (2021)	There are 22 public access points identified as having visual access to the water in the Municipal Public Access Plan. There are no specific objectives in the plan for protecting or improving scenic views, or beach/waterfront views.
Beach Haven Borough	Beach Haven Borough Comprehensive Master Plan (2018)	A goal of the Comprehensive Master Plan is to maintain and continue to promote a visually pleasing aesthetic along the waterfront areas. However, there are no specific objectives included for protecting or improving scenic views, or beach/waterfront views.
Berkeley Township	Berkeley Township Comprehensive Master Plan (1997) General Reexamination of the Master Plan (2019) Environmental Resources Inventory (2012)	The Township Master Plan, the Reexamination Report, and the Township Environmental Resources Inventory include no specific objectives for protecting or improving scenic views, or beach/waterfront views.
Brick Township	Master Plan Reexamination Report (2018) Master Plan: Part 2 – Land Use Element	In the Land Use Element of the Master Plan, there is recognition of the special attraction and scenic value placed on the residential uses of a barrier island location and the over-water views it provides. However, no specific provisions for protecting or enhancing the outward views from within the community, or beach/ocean views are included. The Master Plan Reexamination Report includes no specific objectives for protecting or improving scenic views, or beach/waterfront views.
Eagleswood Township	None Identified	
Harvey Cedars Borough	Municipal Public Access Plan (2017)	A goal of the Municipal Public Access Plan is to maintain and continue to promote a visually pleasing aesthetic along waterfront areas. There are 21 publicly accessible areas listed as having visual access to the waterfront.
Lacey Township	Master Plan (1991) Lacey Township Master Plan Update – Revised Land Use Element (2016); Master Plan Reexamination Report (2018)	The Township Master Plan includes a townscape objective that states that all elements that could be obtrusive to the boating public should be reviewed and specifically addressed through view studies or simulations prior to receiving approvals. The Township Reexamination Report and Revised Land Use Element include no specific objectives for protecting or improving scenic views, or beach/waterfront views.
Lavallette Borough	Master Plan Reexamination (2006);	The Reexamination of the Master Plan encourages the preservation and maintenance of Lavallette’s historic sites. The original Master Plan encourages the importance of aesthetic

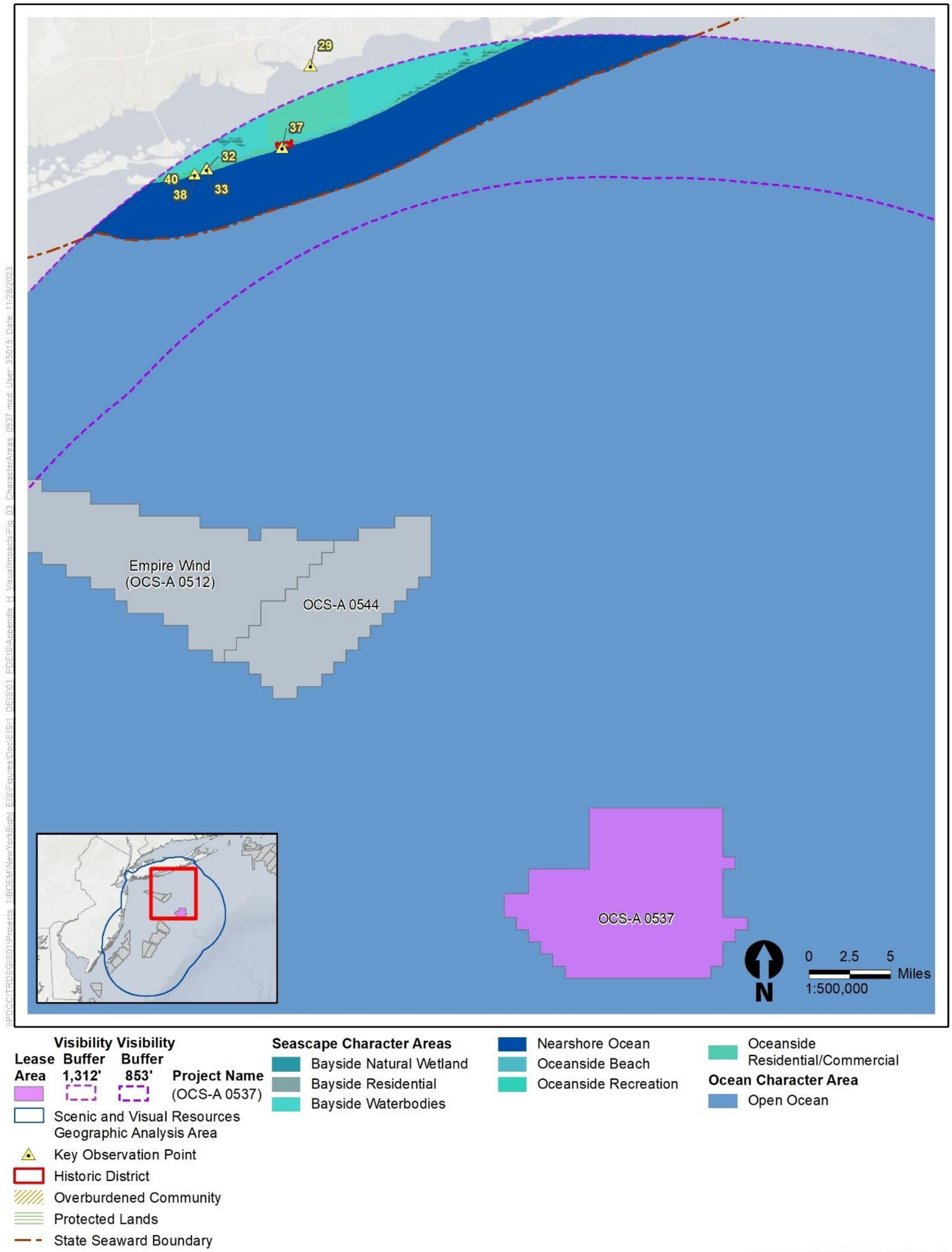
Jurisdiction	Authority	Objectives
	Master Plan for the New Millennium (1999)	streetscapes, commercial land uses, and historical and cultural qualities. However, neither plan includes specific objectives for protecting or improving scenic views, or beach/waterfront views.
Little Egg Harbor Township	Reexamination Report and Master Plan Amendment (2015)	The Township Master Plan includes a goal to promote a desirable visual environment through conservation and preservation of valuable natural features. However, the plan does not include specific objectives for protecting or improving scenic views, or beach/waterfront views.
Long Beach Township	Comprehensive Master Plan Update (2017)	The Comprehensive Master Plan does not include specific objectives for protecting or improving scenic views, or beach/waterfront views.
Mantoloking Borough	2017 Master Plan Re-Examination Report (2017)	The Master Plan does not include specific objectives for protecting or improving scenic views, or beach/waterfront views.
Ocean Township	Ocean Township Master Plan (1990); 2019 Master Plan Reexamination Report (2019)	The Ocean Township Master Plan includes a conservation goal to identify scenic areas within the Township and provide for their preservation. The Reexamination Report includes no specific objectives for protecting or improving scenic views, or beach/waterfront views.
Point Pleasant Beach Borough	2021 Reexamination & Master Plan Amendment	One plan objective is to strive to foster an aesthetically pleasing downtown commercial district for the ease and safety of pedestrians. This includes protecting and enhancing the historic maritime character of the Borough by maintaining appropriate scales of development, intensity of use, and architectural style. However, it does not include specific objectives for protecting or improving scenic views, or beach/waterfront views.
Seaside Heights Borough	Master Plan Reexamination Report (2022); Vision Plan (2009)	The Vision Plan recognized the need for increased access to the bay front. However, neither plan includes objectives for protecting or improving scenic views, or beach/waterfront views.
Seaside Park Borough	2008 Seaside Park Master Plan (2008)	Although a goal of the Master Plan is to encourage desirable visual design of new and upgraded businesses, it does not include specific provisions for protecting or enhancing the outward views from within the community, or beach/ocean views. Standards for preservation of historic structures are included.
Ship Bottom Borough	2021 Master Plan Reexamination Report (2021)	This report prioritizes the value of public access to the waterfront and the importance of a sustainable shoreline void of erosion. However, it does not include specific objectives for protecting or improving scenic views, or beach/waterfront views.
Stafford Township	2017 Master Plan: Land Use Element (2017)	The Land Use Element of the Master Plan does not include specific objectives for protecting or improving scenic views, or beach/waterfront views.
Surf City Borough	Comprehensive Master Plan Re-examination (2019)	This Master Plan Re-examination highlights the need to prioritize the value of public access to the waterfront and the importance of a sustainable shoreline void of erosion, especially being a barrier island community. The municipal Public Access Plan, attached to the Re-examination, works to maintain and promote visually pleasing aesthetic waterfront areas. However, neither plan includes specific objectives for protecting or improving scenic views, or beach/waterfront views.

Jurisdiction	Authority	Objectives
Toms River Township	Natural Resources Inventory (2016) Township of Toms River Master Plan (2017)	No specific objectives are included within the Natural Resources Inventory or the Master Plan for protecting or improving scenic views, or beach/waterfront views.
Tuckerton Borough	Master Plan (2002)	An objective in the Master Plan is to preserve and protect the distinctive physical and historic character of the Borough and preserve maritime heritage by recognizing the ties to Tuckerton Creek, Little Egg Harbor, and the Atlantic Ocean. The Conservation Plan Element states that the protection of scenic visual corridors is valued as an important contribution to the quality of life for residents and should be protected from inappropriate development. These visual corridors are the view of Lake Pohatcong from Route 9, the view of Long Beach Island and Little Egg Harbor from the Tuckerton Cover area, and views of Tuckerton Creek.

H.3 SLVIA Results

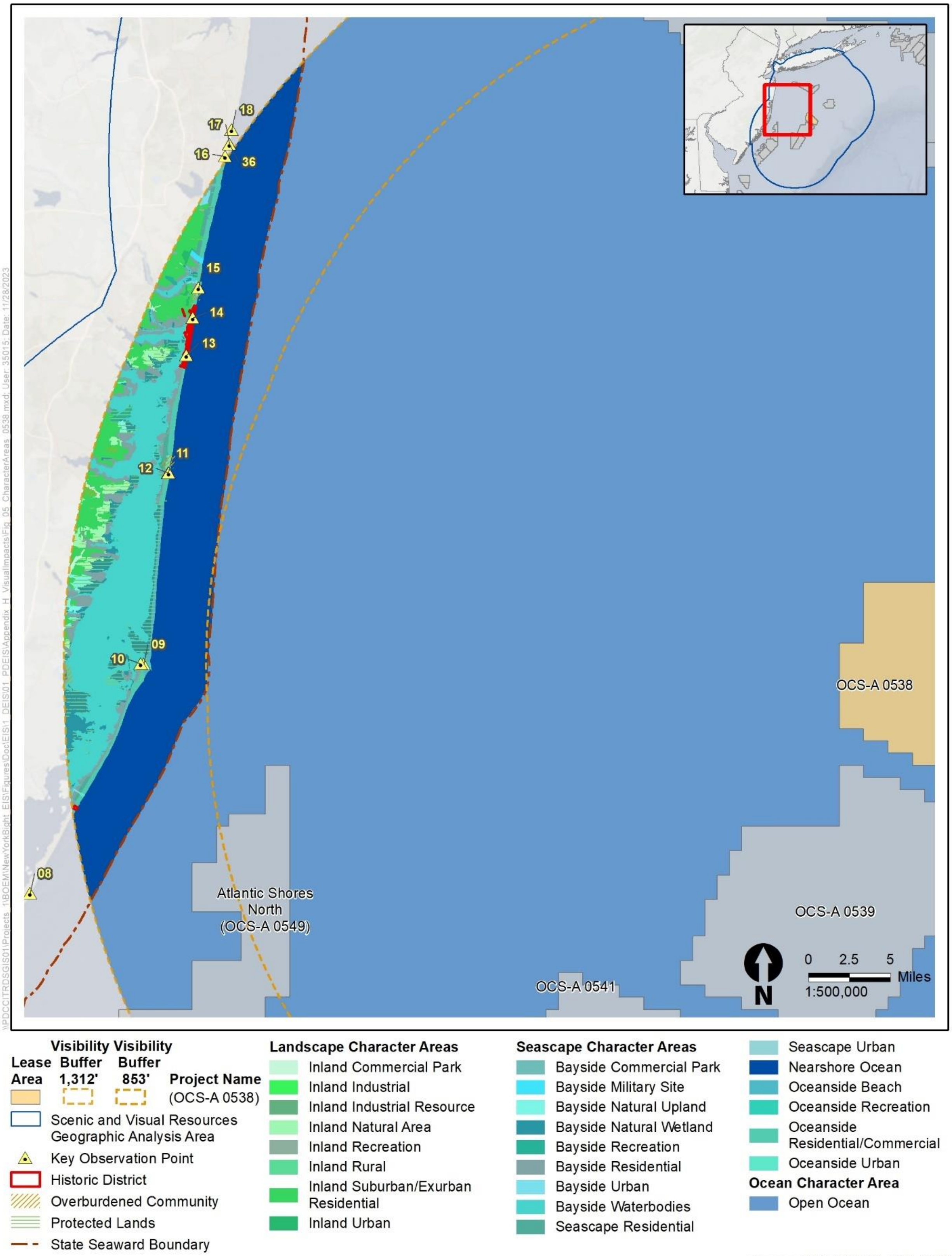
This section presents the results of the SLVIA analysis, organized by SLIA (Section H.3.1) and VIA (Section H.3.2) results. The results are applicable to both action alternatives analyzed in the Final PEIS, Alternative B and Alternative C, unless otherwise specified.

Visual simulations from representative viewpoints (available on BOEM's NY Bight website: https://www.boem.gov/renewable-energy/state-activities/new-york-bight) indicate that daytime and nighttime visibility of wind turbines and offshore substations would be noticeable to the casual observer from the open ocean character area, seascape character areas, landscape character areas, and viewer viewpoints. Figure H-2 through Figure H-7 show character areas with KOPs, sensitive resource areas (e.g., overburdened communities, protected natural landscapes, and historic areas), and visibility buffers for the 1,312-foot (400-meter) and 853-foot (260-meter) wind turbines. The visibility buffers for the two turbine heights are based on the rotor blade tip height and the parameters for the digital elevation model (DEM) and the digital surface model (DSM) using best practices recommended by ESRI (refer to Argonne 2024 for more information regarding viewshed modeling). Figure H-8 through Figure H-13 show the extent of onshore visibility for each lease area and both turbine heights based on viewshed modeling along with KOPs and sensitive resources. Sensitive resources are defined as overburdened communities, protected lands, and publicly accessible cultural and historic sites (refer to Argonne 2024 for more information on these resources).



Source: BOEM 2022, ANL 2023.

Figure H-2. Scenic resources and character areas for OCS-A 0537



Source: BOEM 2022, ANL 2023.

Figure H-3. Scenic resources and character areas for OCS-A 0538

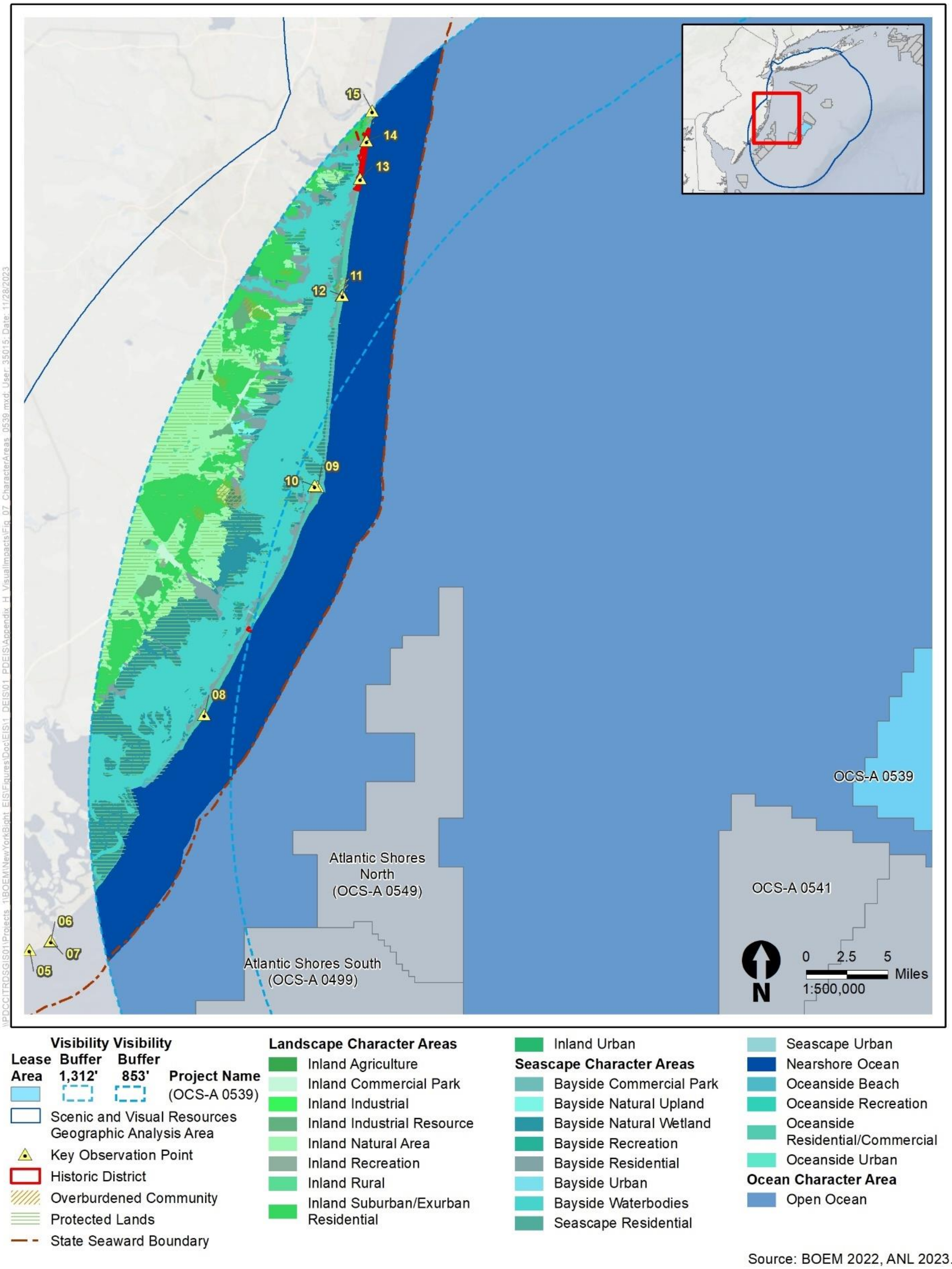


Figure H-4. Scenic resources and character areas for OCS-A 0539

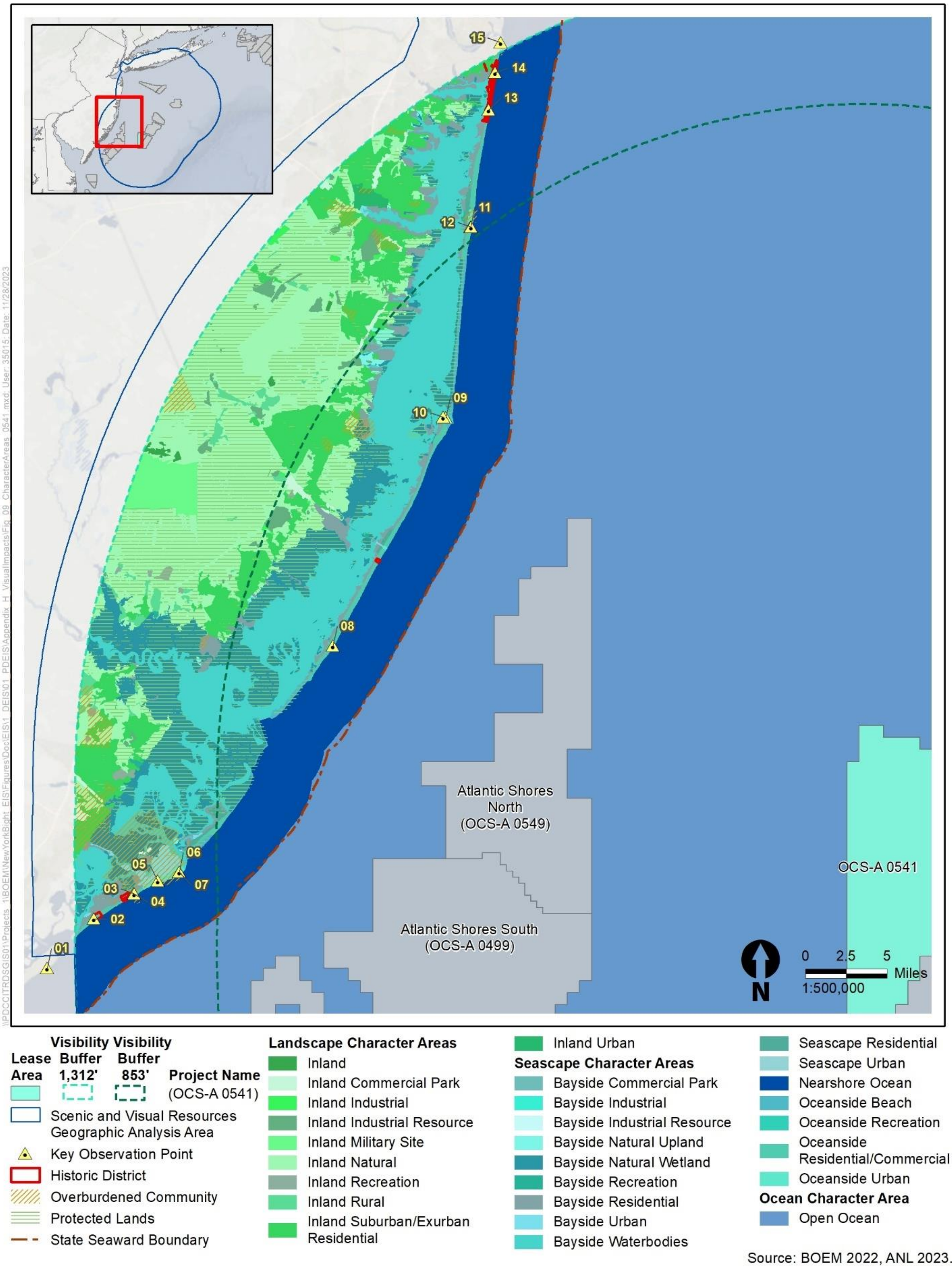


Figure H-5. Scenic resources and character areas for OCS-A 0541

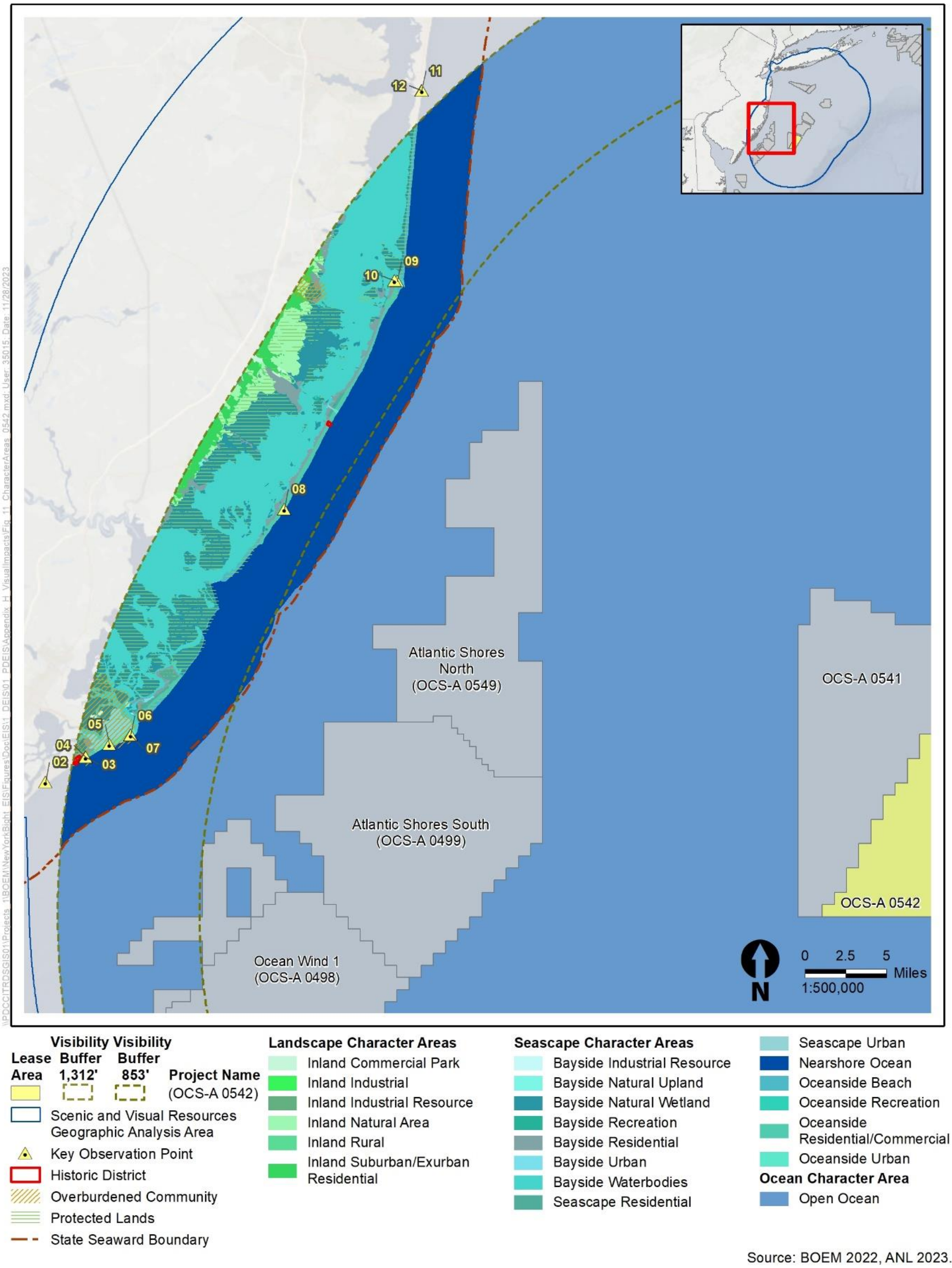


Figure H-6. Scenic resources and character areas for OCS-A 0542

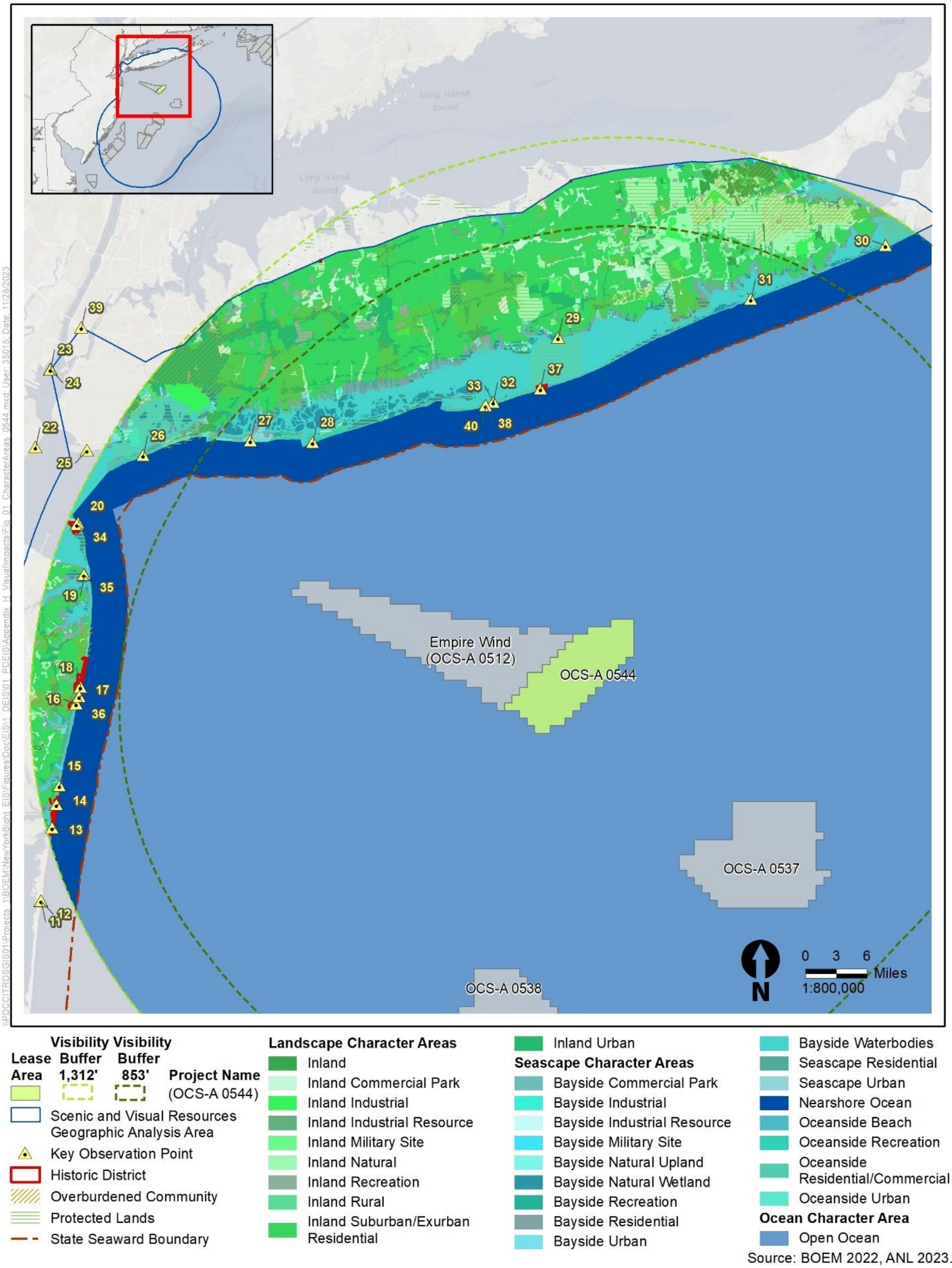
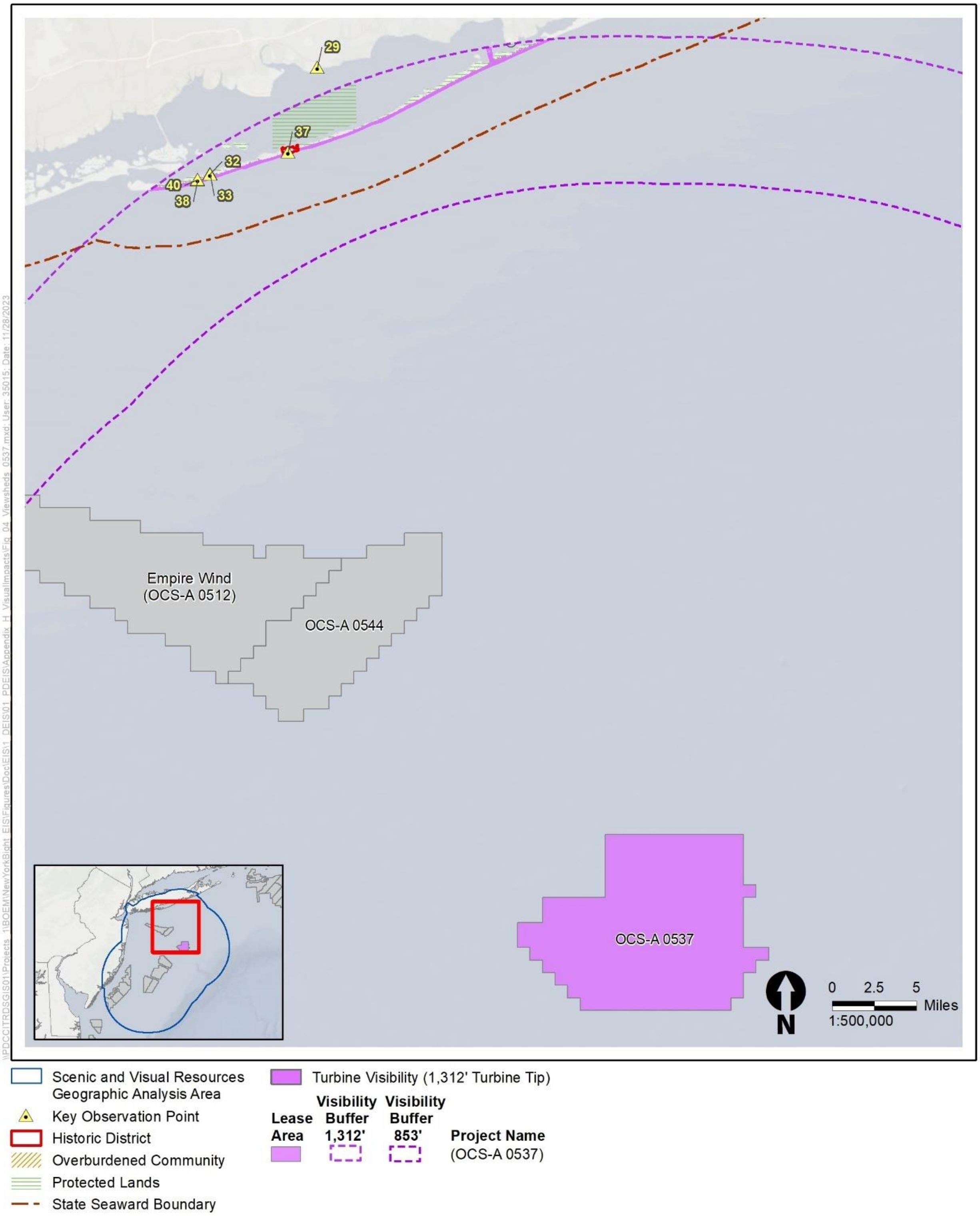
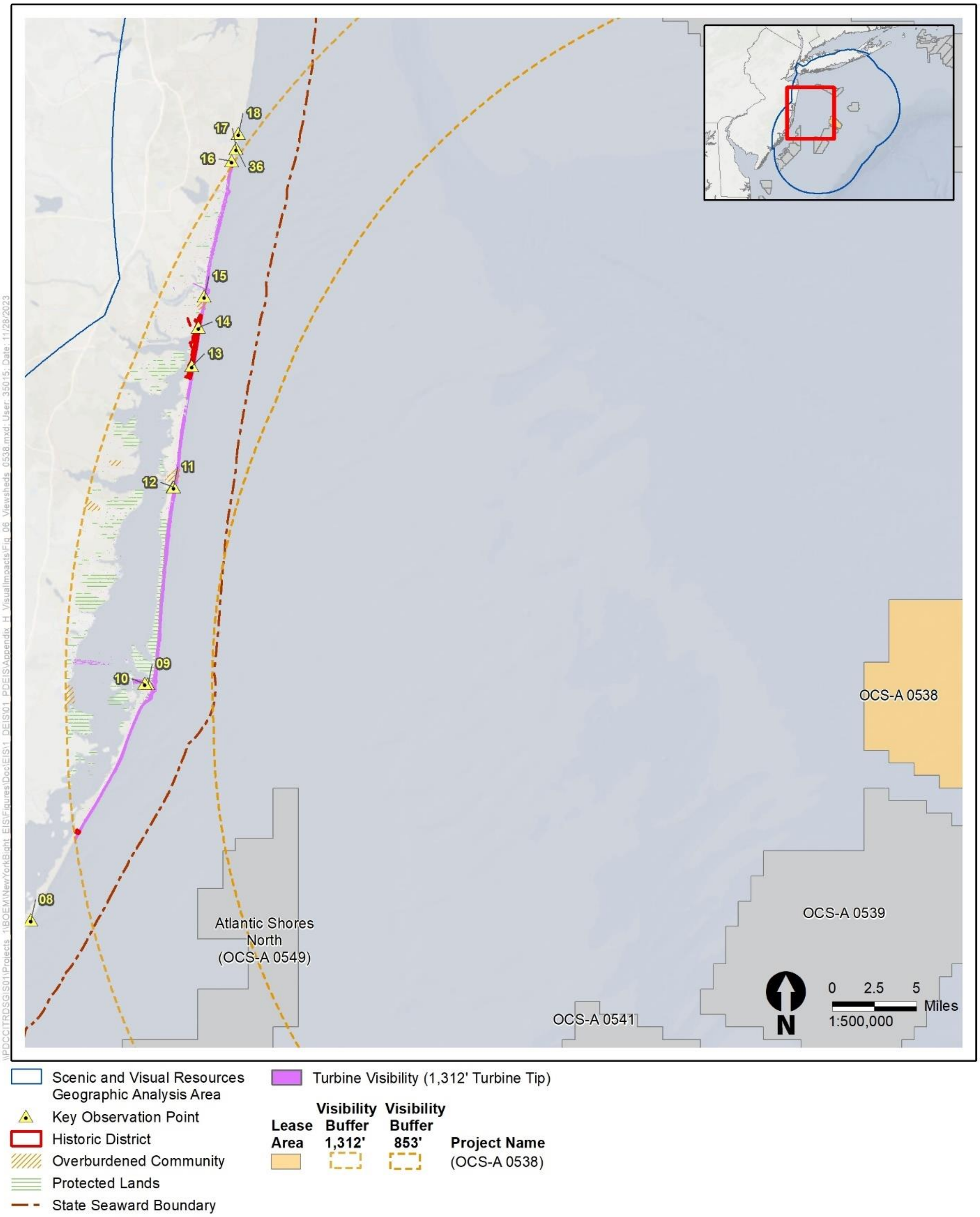


Figure H-7. Scenic resources and character areas for OCS-A 0544



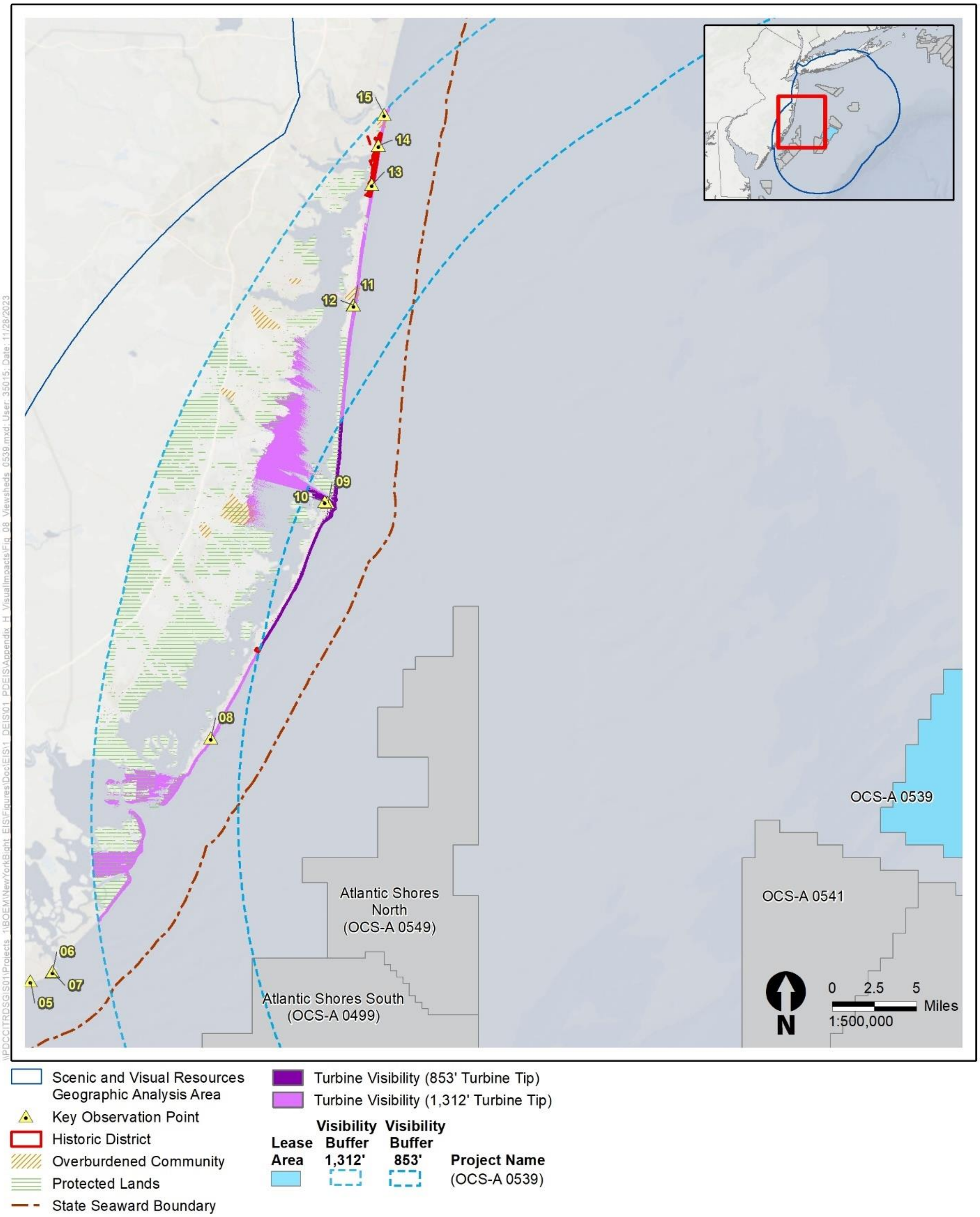
Source: BOEM 2022, ANL 2023.

Figure H-8. Turbine visibility viewshed and KOPs for OCS-A 0537



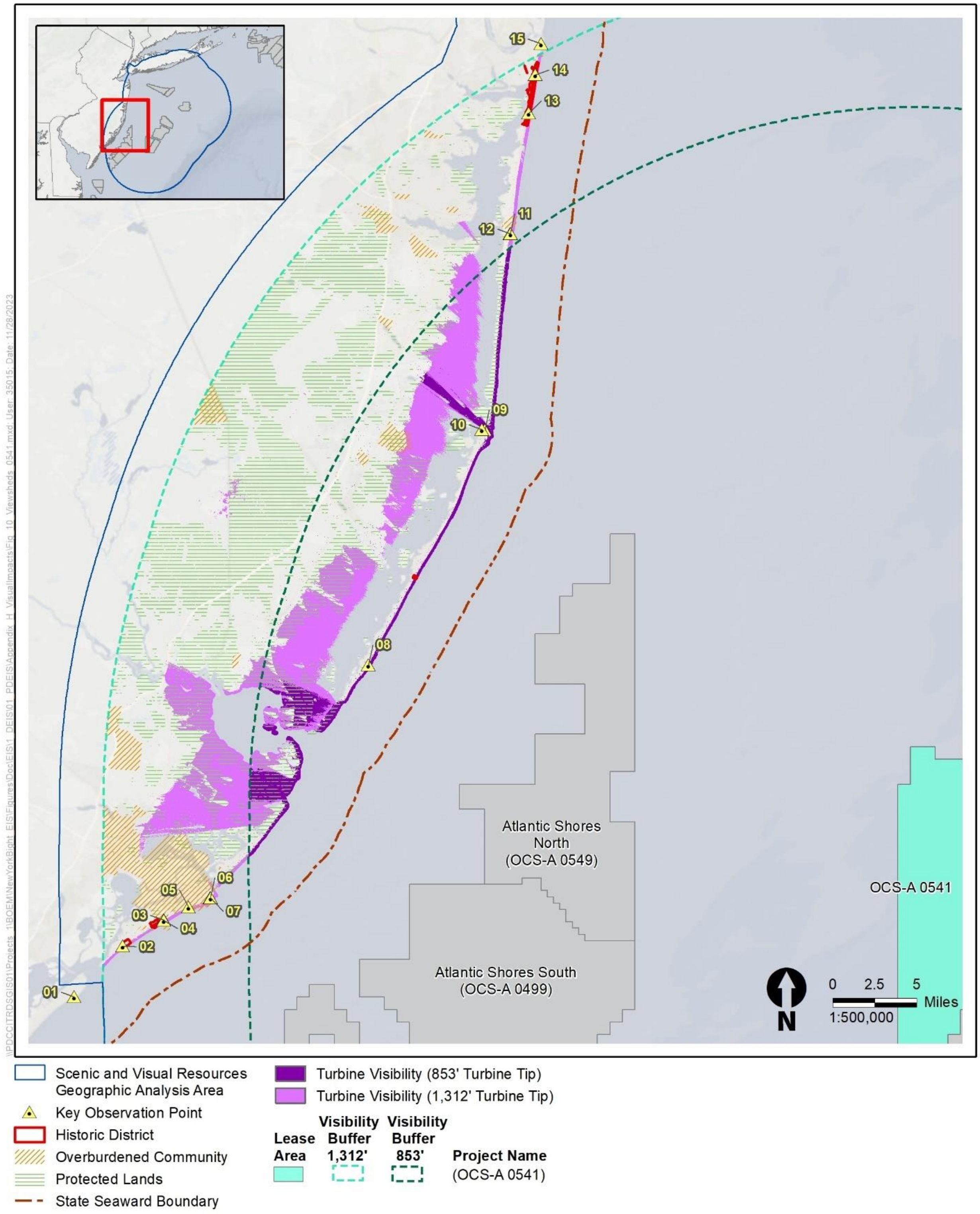
Source: BOEM 2022, ANL 2023.

Figure H-9. Turbine visibility viewshed and KOPs for OCS-A 0538



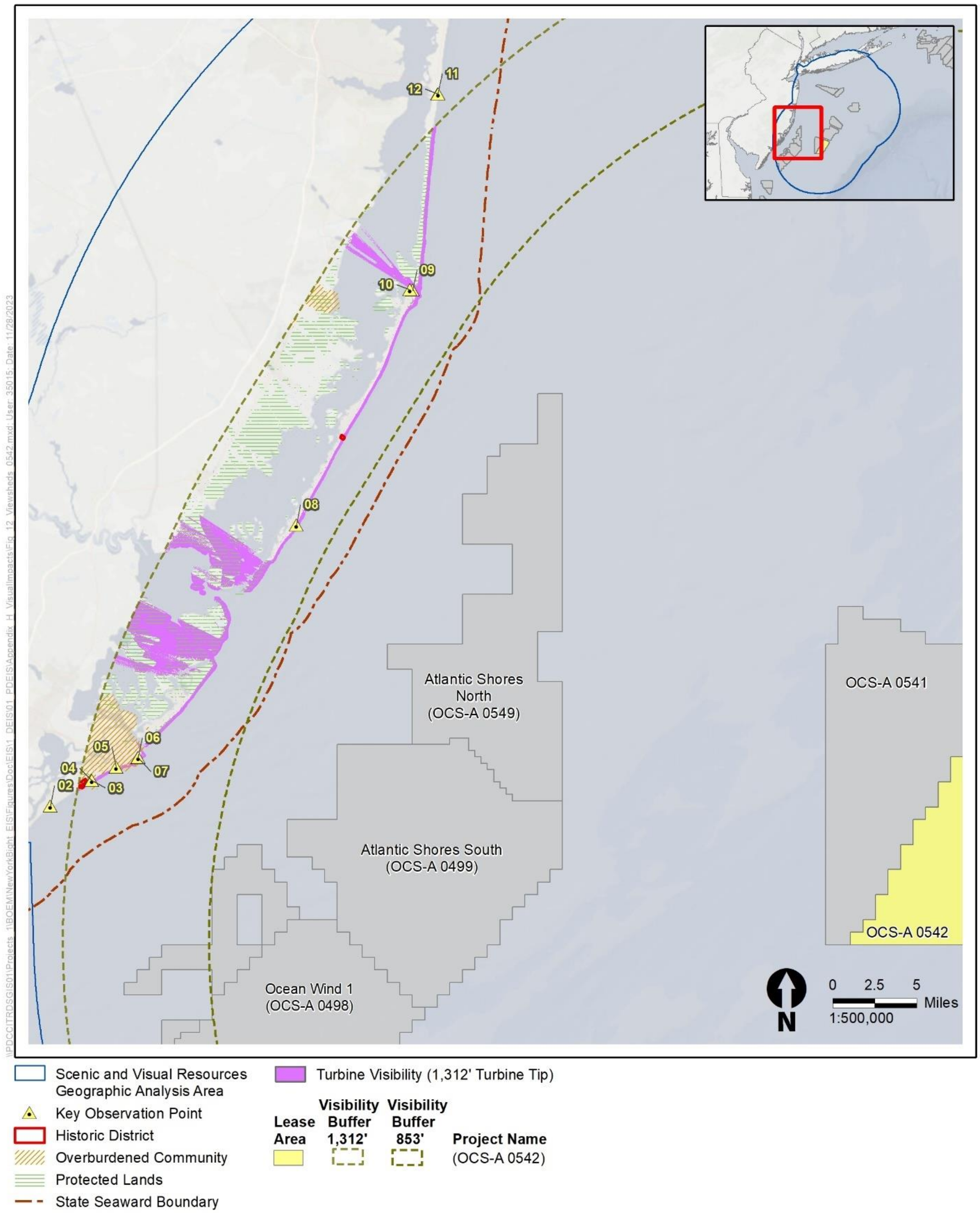
Source: BOEM 2022, ANL 2023.

Figure H-10. Turbine visibility viewshed and KOPs for OCS-A 0539



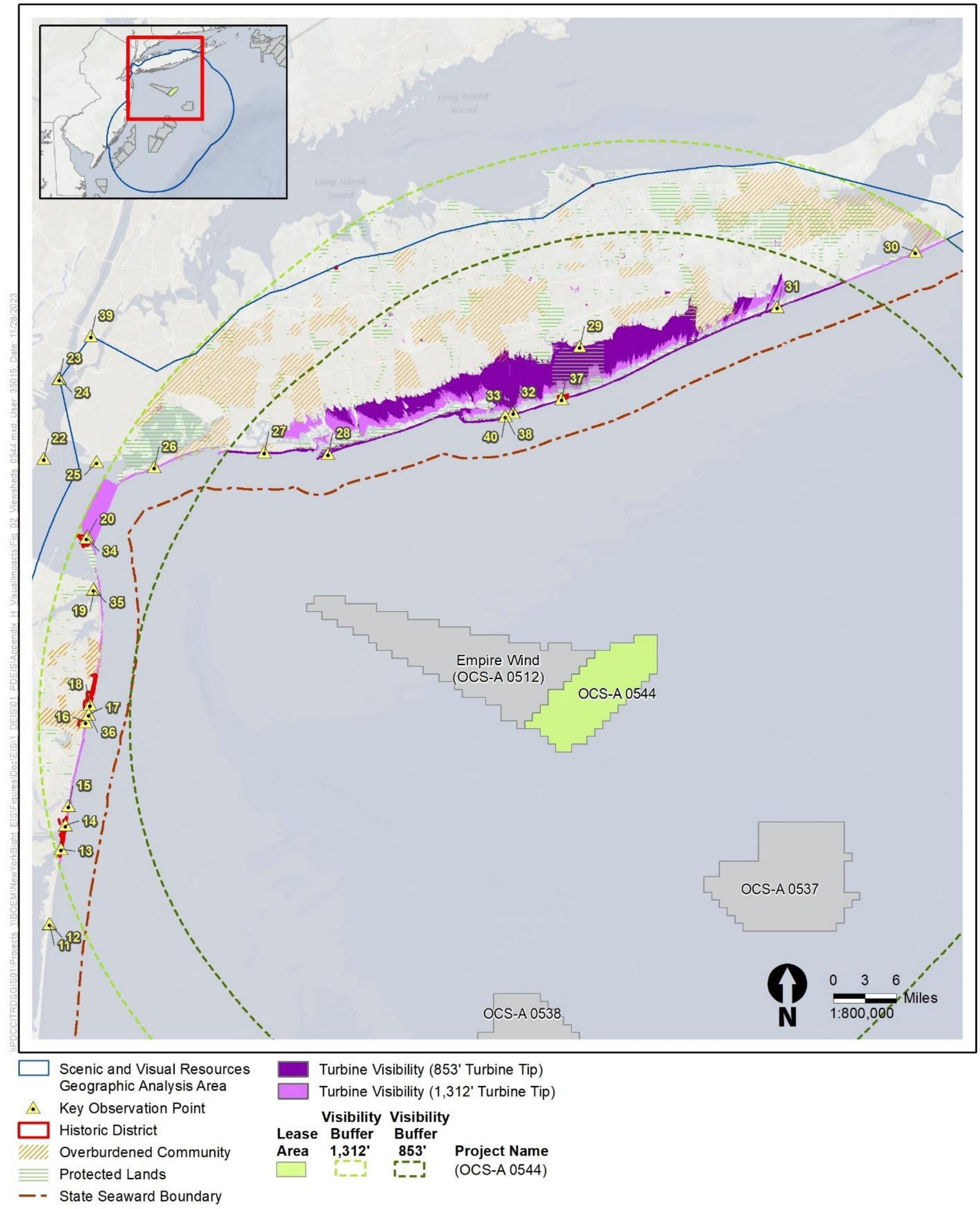
Source: BOEM 2022, ANL 2023.

Figure H-11. Turbine visibility viewshed and KOPs for OCS-A 0541



Source: BOEM 2022, ANL 2023.

Figure H-12. Turbine visibility viewshed and KOPs for OCS-A 0542



Source: BOEM 2022, ANL 2023.

Figure H-13. Turbine visibility viewshed and KOPs for OCS-A 0544

H.3.1 Open Ocean, Seascape, and Landscape Impact Assessment (SLIA)

H.3.1.1 Offshore Open Ocean, Seascape, and Landscape Character

Open ocean, seascape, and landscape character in the geographic analysis area is organized in a three-level hierarchy (Argonne 2024):

- **Level 1:** Defines the broad character of ocean, seascape, and landscape.
- **Level 2:** Character types are relatively homogeneous in character. They are generic in nature and share similar combinations of geology, topography, drainage patterns, vegetation, historical land use and settlement patterns, and perceptual and aesthetic attributes. Level 2 is specific to the seascape character, which is split into two discrete character types: those that maintain visibility to the ocean (oceanside seascape) and those that maintain visibility to the bay (bayside seascape). If both elements are visible, the discrete area is considered part of the oceanside seascape character area. Level 2 is not represented in ocean or landscape character, only in seascape.
- **Level 3:** Level 3 focuses on the aesthetic, perceptual, and experiential aspects of a character area (or type) with unique qualities that contribute to a sense of place. Within Level 3, character areas (or types) are further broken down into specific areas with common character and perceptual attributes. For example, these areas may have similar architectural styles, scale, development patterns, or other similarities that are identified and described for their unique qualities.

Table H-11 identifies the characters, character types, and character areas delineated in the geographic analysis area.

Table H-11. Summary of character (level 1), character types (level 2), and character areas (level 3)

Level 1: Characters	Level 2: Character Types	Level 3: Character Areas
Ocean Character	N/A	Open Ocean
Seascape Character	Bayside	Bayside Commercial Park
		Bayside Industrial
		Bayside Industrial Resource
		Bayside Military Site
		Bayside Natural Area Upland
		Bayside Natural Area Wetland
		Bayside Recreation
		Bayside Residential
		Bayside Urban
		Bayside Waterbodies
		Seascape Residential
		Seascape Urban
	Oceanside	Nearshore Ocean
		Oceanside Beach

Level 1: Characters	Level 2: Character Types	Level 3: Character Areas
		Oceanside Recreation
		Oceanside Residential/Commercial
		Oceanside Urban
Landscape Character	N/A	Inland Agriculture
		Inland Commercial Park
		Inland Industrial
		Inland Industrial Resource
		Inland Military Site
		Inland Natural Area
		Inland Recreation
		Inland Rural
		Inland Suburban/Exurban Residential
		Inland Urban

Source: Argonne 2024.

The following subsections include a description of each character, character type, and character area. Detailed descriptions and photographs of the character areas can be found in Argonne (2024).

H.3.1.1.1 Open Ocean Character

The Open Ocean zone includes the open water of the Atlantic Ocean off the coast of New Jersey and New York and portions of Delaware Bay. This character area's defining characteristic is the presence of open water as a dominant element and unobstructed views in all directions. This primarily includes open waters of the Atlantic Ocean that are 3 nm (5.5 kilometers) beyond the Atlantic shoreline and unbounded by landforms. Human elements, such as ships of various sizes, lighthouses, buoys, and other infrastructure, can be seen at various distances throughout the study area, but the emphasis of the view is consistently on the overall flatness and variable colors of the water.

H.3.1.1.2 Seascape Character Descriptions

The regions that comprise the seascape character type are unified by a view of and relationship to the ocean and other saltwater bodies such as bays, inlets, and sounds, extending 3 nm (5.5 kilometers) from the edge of the ocean's coastline into the ocean. These unified areas include bayside and oceanside features, as they are deeply connected visually, ecologically, and recreationally to each other. The land uses in seascape areas may vary significantly, but the emphasis on the connectivity between the land and ocean remains an important visual and experiential element across all areas with seascape character.

Bayside Seascape Types maintain a view and direct connection to bays and other related saltwater bodies and associated features such as marinas and other developments along the bay and related waterbodies. These areas, however, do not maintain a direct connection to the coastline or ocean itself.

Bayside Commercial Park

These areas reflect business districts and commercial areas composed of office complexes, big box stores, strip malls, and parking lots. Relatively few residential spaces exist within these landscapes. Buildings are nondescript, often single-story, but may also contain office complexes several stories tall. Major roads and highways may have such office parks and strip malls running alongside them, but these character areas are specifically delineated when the density of such development is significant. While non-ocean waterbodies may be visible from the premises, little to no infrastructure or general design of the space and the buildings themselves emphasize the view of the waterbodies.

Bayside Commercial Parks have low sensitivity. Their blocky, nondescript built features cause low susceptibility to changes in their character, and the low scenic quality of commercial parks contributes to the low value associated with the character of these areas. This character area occurs along the coast of Brooklyn, within Gravesend Bay.

Bayside Industrial

Bayside Industrial areas are adjacent to the bay or other bayside waterbody and are industrial in nature, with features such as smokestacks, large blocky buildings, docks, large freight ships, bare earth, concrete, waste pilings, metal silos, warehouses, cranes, vehicles, and industrial materials. The scale of the industrial infrastructure is typically large, with angular, geometric cranes lining the waterfront. Freighters and other large coastal ships move within this environment, adding an additional visual weight and blocky pattern. While they are sometimes connected to residential and urban areas, they typically lack public access and do not provide views of the ocean and horizon.

Bayside Industrial areas have low sensitivity because they are not susceptible to changes to their character from the NY Bight projects due to having similar industrial characteristics, including tall, vertical elements and blocky infrastructure, and the low scenic quality of industrial areas and oftentimes poor condition contribute to the low value associated with the character of these areas. Bayside Industrial areas occur sporadically, mostly along the mainland coastal edge of both New York and New Jersey. There is a higher density of industrial areas within the mainland edge of Brooklyn and western Long Island.

Bayside Industrial Resource

The Bayside Industrial Resource areas consist of industrial zones such as wastewater treatment plants, landfills, and quarries. These industrial resource areas are generally smaller in scale than other industrial facilities, less dependent on large facilities for manufacturing, and are frequently visually obscured by vegetation. These facilities are often more secluded and obscured behind forested areas. The industrial elements within this category generally have low-lying, horizontal flat features, such as retention ponds and mining pits, that may not be visible from public rights-of-way.

Bayside Industrial Resource areas have low sensitivity because they are not susceptible to changes to their character from the NY Bight projects due to having similar industrial characteristics, including tall, vertical elements and blocky infrastructure. Also, the low scenic quality of industrial resource areas and their oftentimes poor condition contribute to the low value associated with the character of these areas. Industrial resource areas occur sporadically, mostly along the mainland coastal edge of both New York and New Jersey. There is a higher density of Bayside Industrial Resource areas within the mainland edge of Brooklyn and western Long Island.

Bayside Military Site

These sites may have docks, piers, or other waterfront resources. When not obscured by vegetation, such as dense trees, military sites generally consist of light industrial and office buildings, gravel roads, chain-link fence, and railways. Buildings are generally small, square, and nondescript in the traditional industrial style of the early 20th century.

Bayside Military Sites are low in sensitivity. They are not susceptible to changes to their character from the NY Bight projects due to their existing light industrial character, including their blocky infrastructure, and they are moderately valued for having some forested areas that contribute to the areas' scenic qualities and having bayside elements like docks and piers. The only Bayside Military Site is near Leonardo, New Jersey, within Sandy Hook Bay.

Bayside Natural Area Upland

Upland forests, shrubland, and grasses within natural or natural-appearing spaces occur within islands of the non-ocean waterbodies, as well as on adjacent bayside upland areas on the mainland and barrier islands. These upland natural areas maintain visual connection to the bay, estuaries, inlets, etc., and often have trails or other forms of access from the natural areas to the non-ocean waterbodies.

Bayside Natural Area Uplands are highly sensitive due to their natural sense of place, and lack of human development or industrial features, making these areas highly susceptible to change from the NY Bight projects. They are also highly valued due to their high scenic quality, wildness, and tranquility. This character area is common along the coastal edges of the mainland in both New York and New Jersey, typically occurring directly behind, and slightly elevated from, tidal wetlands. They are more common in the mainland of southern New Jersey. They can also occur on sufficiently elevated islands and within the non-ocean waterbodies and the barrier islands themselves, which is more common within Long Island.

Bayside Natural Area Wetland

Large swaths of wetlands, marshes, estuaries, mudflats, and islands exist within the interior inlets or sounds, and on the mainland side of coastal islands. Due to the changing nature of the boundaries of marshes, borders of these areas are less defined compared to more stable habitats such as forests. These areas are dominated by emergent grasses, reeds, and rushes.

Bayside Natural Area Wetlands are highly sensitive due to their natural sense of place, and lack of human development or industrial features, making these areas highly susceptible to change from the NY Bight projects. They are also highly valued due to their high scenic quality, wildness, and tranquility. From Ocean City north to Barnegat Lighthouse, a significant portion of the area between the mainland

and the barrier islands is Bayside Natural Area Wetland. The character area also extends from Jamaica Bay to Fire Island.

Bayside Recreation

Bayside Recreation consists of developed green space along the edge of a bay, which has amenities adjacent to a beach. These recreational areas are differentiated from other greenspaces, such as natural areas, by their scale of human development and recreational focus. These non-natural appearing areas often have seascape-related amenities such as marinas, fishing piers, boat launches, and water parks, as well as parks with significant sports and recreational resources such as tennis courts, baseball diamonds, walking trails in non-natural landscapes, and public and private golf courses.

Bayside Recreation areas are highly sensitive. The infrastructure is often limited in these areas, making their character highly susceptible to change. They are highly valued due to their high scenic qualities and locally held values and are often historic designated parks.

Bayside Residential

Bayside Residential consists of developed land that contains mostly residential units of low to high density; with views of bayside saltwater waterbodies from any vantage point, including marinas, docks, and piers; or that are located directly on the shoreline itself. These homes often have direct access to the waterfront and are generally designed in a way to provide significant views of the inlets, marshes, rivers, or other areas on the landward side of the barrier islands. The shoreline can be hardened and highly developed with houses built directly on piers or adjacent to hard-edged shorelines, or soft, naturalized, gradual slopes. The scale of development can be variable.

The Bayside Residential character area is highly sensitive. The composition of low to high density structures—some of which may have architectural historic interest—and lack of industrial elements makes for a character that is highly susceptible to change from the NY Bight projects. Bayside Residential areas are highly valued due to their scenic quality, houses' architectural and/or historic interest, and locally held values based on the bayside orientation.

Bayside Urban

Bayside Urban includes highly developed land with a view of bayside waterbodies from any vantage point—including marinas, docks, and piers—or that are located directly on the bayside shoreline. These areas are multiuse, with a mix of commercial, residential, and public lands. There can be restaurants, commercial districts, or public/private parks with significant infrastructure for waterfront access, such as large marinas or piers.

The sensitivity for Bayside Urban areas is medium. They are typically characterized by dense built structures with significant waterfront access infrastructure. This highly developed area has low susceptibility to character change from the NY Bight projects. Bayside Urban areas are highly valued for their tourism value and connection to the bayside waterbodies, and sometimes for having historically significant features. In Atlantic City, much of the Bayside Urban area consists of large hotels and entertainment complexes situated along the water's edge. In addition, houses, condominiums, and apartment buildings are densely situated along the canals and marinas.

Bayside Waterbodies

Bayside Waterbodies are partially enclosed marine waterbodies with direct access to the ocean and the associated docks, marinas, and other infrastructure. Although not essential to the viewing experience, these areas may have full, partial, or no views of the ocean and extend to the edge of river deltas and other waterbodies.

Bayside Waterbodies are highly sensitive and highly valued for their scenic qualities. These calm waterbodies are highly susceptible to change. The inlets between Ocean City and Seaside Park, with their extensive natural areas, are an example of Bayside Waterbodies.

Seascape Residential

Seascape Residential areas are neighborhoods directly tied to the seascape character but that do not maintain direct views of the ocean, non-ocean waterbodies, beaches, or other marine infrastructure. They are intrinsically connected to the seaside character due to proximity, character of the built environment, or overall experience, but they do not directly connect to the ocean features. For example, a barrier island may be large enough that the interior residential streets maintain cohesive cultural and/or architectural cues to seaside elements but are too far from beach access points or are disconnected due to distance and large roads that act as a visual and physical barrier to the ocean and non-ocean waterbodies.

These areas are highly sensitive, highly susceptible to change from industrial infrastructure, and highly valued for their aesthetic and perceptual elements. Ocean City, Mantoloking, and Navesink are all examples of Seascape Residential areas.

Seascape Urban

Seascape Urban areas include developed urban land that is directly tied to seascape character but does not maintain direct views of the ocean, dunes, beaches, or other marine infrastructure. They have medium sensitivity and are typically characterized by densely built structures and are highly locally valued for their integration into the seascape character elements and tourism. Atlantic City, New Jersey, and Island Park, New York, are examples of Seascape Urban areas.

Oceanside Seascape Types maintain clear visibility and connectivity to the ocean. The shared inter-visibility between natural lands and developed areas and the sea is such that the land, coastline, and sea maintain visibility of the ocean.

Nearshore Ocean

The nearshore ocean stretches 3 nm (5.5 kilometers) from the coastline in which the ocean relates to the seascape. Here, long horizontal waves typically roll towards the coast, with regular whitecaps and breaking waves occurring, except in calm weather. Colors and textures vary consistently, and change constantly, throughout this stretch of water.

Nearshore Ocean is highly sensitive due to its pristine, flat, vast, and minimal character and lack of infrastructure and industrial elements. It is highly valued for scenic qualities, wildness, and tranquility. Nearshore ocean extends all along the New York and New Jersey.

Oceanside Beach

Oceanside Beach areas maintain features, such as dunes and vegetation, in a way that makes the beach appear to be natural or have a minimal human impact. Here, human development is either not present, mostly obscured, or is built in a way that enhances rustic and/or natural features. Activities are passive and active, from swimming, surfing, and beachcombing, to relaxation and viewing nature. The emphasis of the view is the uninterrupted, wide horizon of the beach and ocean. Examples include Brigantine Beach, Island Beach State Park, and Highland Beach of Sandy Hook National Park in New Jersey. New York examples include Breezy Point and the majority of Fire Island's coastline.

Oceanside Beach is highly susceptible to changes due to its flat nature and natural appearance, is highly valued due to scenic quality and locally held values, and is therefore a highly sensitive environment.

Oceanside Recreation

Oceanside Recreation areas are characterized by developed recreational park land with a view of the beach and/or ocean from any vantage point. These include walking trails and seaside promenades, seaside recreational resources, public marinas, and piers. The infrastructure is often limited within Oceanside Recreation areas, but when it is present, it is human-scale and not industrial. Jones Beach and Robert Moses State Park are examples of Oceanside Recreation areas.

The Oceanside Recreation character is highly susceptible to change. These areas are highly valued due to their high scenic qualities with oceanside characteristics and their locally held values, and they are often natural or historic designated parks.

Oceanside Residential/Commercial

This zone consists of developed residential land, with a view of the beach and/or ocean from any vantage point. Architectural styles vary, but seaside residential units may reflect cottage, Victorian, and modern styles with an emphasis on decks, balconies, and windows that encourage views of the surrounding seascape. Access to the beach and ocean is often delineated through fenced walkways or boardwalks, often at the end of streets that abut dunes, guiding individuals up the dunes to the beach and ocean. In other instances, commercial areas such as cafes, gift shops, hotels, and other small-scale businesses are intermixed with residential units and maintain architectural vernacular that connects them to the seascape. Vegetation can include dune grasses and shrubs along the more natural beach and dune edge, and conventional landscaping elements within the properties themselves.

These areas are highly sensitive. The medium density structures with historic buildings and architectural significance are highly susceptible to change. The scenic quality, historic interest, and local value towards oceanside orientation make this character area highly sensitive. Oceanside Residential/Commercial areas occur between Ocean City and Ventnor City.

Oceanside Urban

Oceanside Urban areas consist of dense residential, commercial, and public lands, while still emphasizing the view of the beach and/or ocean. Certain elements that regularly occur, such as boardwalks or other paths along the beach edge, provide additional means for recreation, including food, drink, and other entertainment. Although the oceanside urban structures are often dense they have scenic quality and historic interest. Brighton Beach and Long Beach are examples of Oceanside Urban areas, with a variety of dense multi-use buildings, hotels, and beach recreation.

The scenic quality, historic interest, and local value towards oceanside and historically significant features make these areas highly valued environments.

H.3.1.1.3 Landscape Character

Land uses and landcover types vary significantly across the Landscape Character type. The common thread amongst the landscape character areas is that they have minimal visibility and opportunities for interaction with the ocean and/or seascape in general. Typologies in the study range from the highly urban, dense built environment of Manhattan, suburban New Jersey, and the agricultural landscapes of eastern Long Island, to the extensive natural areas of central New Jersey. While changes in elevation may allow for rare instances of ocean views from certain vantage points, such as skyscrapers in Midtown Manhattan, the landscape and seascape boundary is on the mainland wherever direct, ground-level connectivity to the seascape has ended.

Inland Agriculture

This character area consists of managed fields for agricultural purposes, and the adjacent housing and related agricultural structures such as barns, silos, and other elements of the farmstead. Fields are typically large, rectangular, and consist of pasture, row crops, or large raised beds and/or greenhouse structures for a variety of crops and agricultural products.

Inland Agriculture areas are highly sensitive. Agricultural areas consist of open fields with flat to rolling hills containing farm-related light industrial infrastructure such as silos that lend significant vertical elements to the character, making Inland Agriculture areas moderately susceptible to change due to the NY Bight projects. Agricultural fields provide tranquil scenic quality and open landscape views, making for high locally held values associated with them and overall high value in their character. This character area is found inland and to the far south in New Jersey, and inland to the far east of Long Island.

Inland Commercial Park

Inland Commercial Park areas are composed of office complexes, big box stores, strip malls, and parking lots. Relatively few residential units exist within these landscapes. Buildings are nondescript, often single-story buildings, but may contain office complexes several stories tall. Major roads and highways may have such office parks and strip malls along them, but these character areas are specifically delineated when the density of such development is significant. These typically occur near highway ramps and have no proximity to or view of the ocean.

Inland Commercial Park areas have low sensitivity. Their blocky, nondescript built features and varying human development create low susceptibility to changes in character from the NY Bight projects, and the low scenic quality of commercial parks contributes to the low value associated with their character. Inland Commercial Park occurs frequently adjacent to urban and residential areas along stretches of highway.

Inland Industrial

These are significant areas of developed land that are industrial in nature, with features such as smokestacks, large blocky buildings, and limited access to the shoreline for the public. While they are connected to residential and urban areas, these large areas typically lack public access and do not particularly provide views of the ocean and horizon. Bare earth, concrete, waste pilings, metal silos, warehouses, vehicles, and industrial materials are typical in this environment.

Inland Industrial areas have low sensitivity because they have a low susceptibility to changes to their character from the NY Bight projects due to their similar industrial characteristics, including tall, vertical elements and blocky infrastructure; the low scenic quality of industrial areas and their oftentimes poor condition contribute to the low value associated with the character of these areas. Inland Industrial areas are sporadic throughout the geographic analysis area, with increasing frequency in areas surrounding New York City and Jersey City.

Inland Industrial Resource

Inland Industrial Resource areas consist of industrial zones related to natural resources, such as wastewater treatment plants, landfills, and quarries. They are generally smaller in scale than other industrial facilities, less dependent on large facilities for manufacturing, and are frequently visually obscured by vegetation. These facilities are often more secluded and obscured behind forested areas. The industrial elements within this category are smaller in scale and generally consist of low-lying, horizontal flat features, such as retention ponds and mining pits, that may not be visible from public rights-of-way.

Inland Industrial Resource areas have low sensitivity. They are moderately susceptible to changes to their character from the NY Bight projects. Although there is an industrial character, infrastructure is at a smaller scale with often low-lying horizontal flat features. However, the low scenic quality of Inland Industrial Resource areas contributes to the low value associated with their character. Inland Industrial Resource areas are infrequent but dispersed evenly throughout the geographic analysis area. They often exist along the edge of large population centers, adjacent to forests and/or wetlands.

Inland Military Site

When not obscured by vegetation such as dense trees, Inland Military Sites generally consist of light industrial infrastructure, office buildings, gravel roads, chain-link fence, and railways making them moderately valued. Buildings are generally small, square, and nondescript in the traditional industrial style of the early 20th century.

Inland Military Sites consist of extensive forested areas of moderate to high scenic quality, along with varying industrial elements, making them moderately susceptible to changes to their character from the NY Bight projects and moderately valued due to their scenic qualities. Sections of central and southern New Jersey have large military complexes, mostly set far from developed areas.

Inland Natural Area

Inland Natural Areas predominantly include greenspace that is natural or natural appearing. Inland, this typically comprises forests, savannahs, and grasslands. Pine barrens are a representative habitat of such natural area. These spaces lack significant development, or at least appear to lack development, using smaller trails and paths enclosed in these natural spaces, rather than wide trails with high visibility.

Inland Natural areas are highly sensitive due to their sense of place and lack of human development/ built environment, making these areas highly susceptible to change from the NY Bight projects. They are also highly valued due to their high scenic quality, wildness, and tranquility. Much of inland central and southern New Jersey is composed of natural areas. In contrast, far eastern Long Island has significant natural areas; western and central Long Island has natural areas along inland waterbodies.

Inland Recreation

These areas include developed recreational park lands with no view of the beach and/or ocean and that are clearly part of the inland landscape. These include parks with significant sports and recreational resources such as tennis courts, baseball diamonds, walking trails in non-natural landscapes, as well as public and private golf courses.

Inland Recreation areas are highly sensitive. They are mainly composed of developed parks and sports infrastructure, which is not similar in character to WTG infrastructure, making the character of the area highly susceptible to change. Recreation areas have high locally held value, often have significant or historic designation, and have high scenic qualities, making them highly valued in character. In Long Island, many of these areas are highly developed parks with baseball fields, tracks, open fields for recreation, and clearly designed walking paths, all identifying areas for specific active recreation.

Inland Rural

Inland Rural areas have a low population density. Architecturally there may be similar vernacular elements related to agricultural areas, but significant architectural and structural elements persist between Inland Rural and the Inland Suburban/Exurban Residential character areas.

Sensitivity is high for Inland Rural character areas. These areas are typically open with flat to rolling hills with sparse residential structures, making the character of the area highly susceptible to change due to the NY Bight projects. They may have valued conservation and open space areas around the sparse residential homes, but the homes themselves typically lack architectural interest, making them moderately valued. Southern inland New Jersey and far eastern Long Island have instances of low-density housing often set within natural areas such as forest land, or adjacent to agricultural fields. These do not include farmsteads, but rather the low-density development far from the urban/suburban core.

Inland Suburban/Exurban Residential

Inland Suburban/Exurban Residential character areas reflect developed land, mostly residential units, that do not have a view of the beach and/or ocean from any vantage point. These neighborhoods are clearly part of the inland landscape, and lack connection or reference to the seascape. They vary in architectural styles and densities, but most importantly do not bear architectural or cultural elements associated with seaside communities. There is significant variation in architectural and structural styles of Inland Suburban/Exurban Residential areas, ranging from conventional suburban design at various densities, to exurban and rural styles.

The Inland Suburban/Exurban Residential character areas are highly sensitive. They lack industrial elements similar to that of a WTG and are composed of mostly residential structures, which are minimal when compared to the project infrastructure, making the area highly susceptible to change to its character due to the NY Bight projects. These areas may have valued conservation and open space areas around the residential neighborhoods, but the homes themselves lack significant architectural elements and there are no particular locally held values tied to this character, making it moderately valued. In Long Island, the Inland Suburban/Exurban Residential area is defined by a dense, gridded network of streets and homes, of varying styles typical of suburban conventions of the 20th century. In New Jersey, there is a similar density closer to the coast. Further inland, the housing density and size of homes increases, and the structure of neighborhoods is less gridded.

Inland Urban

Inland Urban areas consist of developed land without a view of the beach or ocean from any vantage point. Dense commercial areas, dense residential areas with apartment buildings, and other areas with significant development are considered in this landscape.

Inland Urban character areas are overall low in sensitivity. They typically have lower scenic qualities, but have locally held value, tourism value, and sometimes historically significant features, making their character moderately valued. Long Island, New York, includes several examples of Inland Urban.

H.3.1.2 Sensitivity

The sensitivity of an open ocean, seascape, or landscape impact receptor is dependent on its susceptibility to change and its perceived value to society. Sensitivity is based on the value placed on a character area by residents and visitors and the susceptibility of the character area, which is the ability to accept or not accept additions of elements or features that affect the scenic character of that area. Receptor sensitivity is recorded on an ordinal scale of high, medium, or low based on information from the baseline data collected; therefore, sensitivity of each character area is determined and described in the character area classification part of the methodology. Section 3.6.9, Table 3.6.9-5, Table 3.6.9-6, and Table 3.6.9-7 contain detailed definitions of the criteria ratings (high, medium, low) for susceptibility, value, and sensitivity. *Ocean, Seascape, Landscape, and Visual Impact Assessment of the New York Bight Offshore Wind Lease Areas* (Argonne 2024) has detailed baseline data and descriptive rationale for the rating determinations.

Table H-12 summarizes the susceptibility, value, and sensitivity ratings for the open ocean, seascape, and landscape character as described in the preceding character area descriptions.

Table H-12. Open ocean, seascape, and landscape sensitivity

Open Ocean, Seascape, and Landscape Character Area	Susceptibility	Value	Sensitivity
Open Ocean	High	High	**High**
Seascape – Bayside Seascape			
Bayside Commercial Park	Low	Low	**Low**
Bayside Industrial	Low	Low	**Low**
Bayside Industrial Resource	Low	Low	**Low**
Bayside Military Site	Low	Medium	**Low**
Bayside Natural Area Upland	High	High	**High**
Bayside Natural Area Wetland	High	High	**High**
Bayside Recreation	High	High	**High**
Bayside Residential	High	High	**High**
Bayside Urban	Low	High	**Medium**
Bayside Waterbodies	High	High	**High**
Seascape Residential	High	High	**High**
Seascape Urban	Low	High	**Medium**
Seascape – Oceanside Seascape			
Nearshore Ocean	High	High	**High**
Oceanside Beach	High	High	**High**
Oceanside Recreation	High	High	**High**
Oceanside Residential/Commercial	High	High	**High**
Oceanside Urban	Medium	High	**High**
Landscape			
Inland Agriculture	Medium	High	**High**
Inland Commercial Park	Low	Low	**Low**
Inland Industrial	Low	Low	**Low**
Inland Industrial Resource	Medium	Low	**Low**
Inland Military Site	Medium	Medium	**Medium**
Inland Natural Area	High	High	**High**
Inland Recreation	High	High	**High**
Inland Rural	High	Medium	**High**
Inland Suburban/Exurban Residential	High	Medium	**High**
Inland Urban	Low	Medium	**Low**

H.3.1.3 Magnitude

The magnitude of effect in an open ocean, seascape, or landscape depends on the size or scale of the change associated with the proposed project, the geographic extent of the change based on the viewshed, and the duration and reversibility of a NY Bight project. Acreages of character areas in the offshore geographic analysis area overall and within the viewshed (i.e., the amount of character area from which the WTG array would be visible) are listed in Table H-13 for the 1,312-foot (400-meter) wind turbines and Table H-14 for the 853-foot (260-meter) wind turbines. Each lease area is measured/calculated as a fraction of the entire six lease area. The acreages for each individual lease are greater than the total area for the combined six-project geographic analysis area because the individual lease viewsheds overlap.

Note that character areas that are not a part of the geographic extent that is visually exposed to the offshore projects but that are adjacent to it may not be physically affected but may be perceptually affected. For instance, the Oceanside Residential character areas on Long Beach Island that have views to the offshore project may be the only character areas on the island that are directly affected. However, the other character areas of Long Beach Island adjacent to or one removed from the Oceanside Residential character areas (e.g., Seascape Residential, Bayside Recreation, Bayside Commercial Park, Bayside Urban) may be perceptually affected because they are all a cohesive part of the Long Beach Island community, and the offshore wind energy development becomes a part of the identity of the whole community.

Size and scale of change considers changes to the physical elements of the open ocean, seascape, and landscape, and their aesthetic, experiential, and perceptual aspects. Although size and scale does not refer to the size and scale of the project per se, understanding the degree of visibility provides measurable context for analyzing the perceptual aspects of scale, prominence, and impacts on open ocean, seascape, and landscape. Table H-15 and Table H-16 list specific locations in New York and New Jersey where the NY Bight projects' noticeable features, based on their heights, distances, and EC for the 1,312-foot (400-meter) WTGs and 853-foot (260-meter) WTGs, respectively, have a perceptual effect on the open ocean, seascape, or landscape. Higher impact levels would stem from unique, extensive, and long-term appearance of strongly contrasting, large, and prominent vertical structures in the otherwise horizontal open ocean and seascape environments where wind turbine structures are an unexpected element. Table H-17 and Table H-18 break out the geographic extent of each character area based on project noticeability and provide additional detail to describe the degree of change from existing conditions for each lease area. Within Table H-17 and Table H-18, the project analysis area corresponds to the area within a 50-mile (80.5-kilometer) buffer of each individual lease area and is equivalent to the geographic analysis area for all six NY Bight lease areas. The impact area is the portion of the project analysis area that is visible and is associated with each individual lease area, not all six lease areas combined.

Operational effects would be similar to those of end-stage construction and installation and would be long term and fully reversible. The duration and reversibility of each character area is documented in the summary tables, Table H-19 through Table H-32.

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Table H-13. Area of open ocean, seascape, and landscape character areas within the project area viewsheds for 1,312-foot WTGs

Character Area	Total Area in the Geographic Analysis Area		Area Within the 1,312-Foot WTG GAA Viewshed [1]													
			New York Bight All Lease Areas		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544	
	Square Miles	Square Kilometers	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected
Open Ocean	15,569.90	40,325.86	15,569.90 (40,325.86)	100.00%	8,948.43 (23,176.33)	57.47%	8,987.57 (23,277.71)	57.7%	9,268.76 (24,005.98)	59.5%	8,568.93 (22,193.44)	55.0%	9,011.49 (23,339.64)	57.9%	6,844.82 (17,728.00)	44.0%
Bayside Seascape																
Bayside Commercial Park	0.44	1.15	0.001 (0.004)	0.3%	--	--	0.000 (0.001)	0.1%	0.000 (0.001)	0.1%	0.000 (0.001)	0.1%	0.000 (0.000)	0.02%	0.000 (0.001)	0.1%
Bayside Industrial	5.74	14.87	0.047 (0.121)	0.8%	0.000 (0.000)	0.0%	--	--	--	--	0.000 (0.001)	0.8%	0.000 (0.000)	0.02%	0.046 (0.120)	0.8%
Bayside Industrial Resource	0.42	1.09	0.115 (0.299)	27.3%	--	--	--	--	--	--	0.000 (0.003)	0.9%	0.001 (0.002)	0.5%	0.114 (0.295)	27%
Bayside Military Site	0.58	1.49	0.040 (0.103)	6.9%	--	--	0.037 (0.095)	6.4%	0.033 (0.085)	5.7%	0.027 (0.070)	4.7%	--	--	0.031 (0.081)	5.5%
Bayside Natural Upland	13.81	35.76	0.441 (1.141)	3.2%	0.009 (0.024)	0.1%	0.003 (0.008)	0.1%	0.004 (0.010)	0.1%	0.006 (0.015)	0.2%	0.003 (0.008)	0.1%	0.424 (1.099)	3.1%
Bayside Natural Wetland	154.00	398.85	65.994 (170.923)	42.9%	0.297 (0.769)	0.2%	0.071 (0.184)	0.1%	7.439 (19.267)	6.6%	51.343 (132.979)	45.4%	18.109 (46.903)	16.0%	14.158 (36.669)	9.2%
Bayside Recreation	13.98	36.22	0.924 (2.394)	6.6%	0.015 (0.038)	0.1%	0.017 (0.045)	0.5%	0.018 (0.048)	0.5%	0.038 (0.099)	1.0%	0.013 (0.033)	0.3%	0.863 (2.236)	6.2%
Bayside Residential	71.73	185.78	1.848 (4.788)	2.6%	0.102 (0.265)	0.1%	0.119 (0.308)	0.3%	0.286 (0.742)	0.8%	0.564 (1.460)	1.5%	0.185 (0.479)	0.5%	1.113 (2.883)	1.6%
Bayside Urban	12.06	31.22	0.122 (0.316)	1.0%	0.003 (0.009)	0.03%	0.004 (0.011)	0.1%	0.002 (0.005)	0.1%	0.064 (0.164)	1.5%	0.048 (0.124)	1.2%	0.053 (0.136)	0.4%
Bayside Waterbodies	419.31	1,086.01	184.216 (477.116)	43.9%	0.994 (2.574)	0.2%	0.610 (1.579)	0.3%	16.438 (42.574)	8.3%	58.779 (152.236)	29.8%	13.398 (34.701)	6.8%	124.47 (322.38)	29.7%
Seascape Residential	9.04	23.42	0.046 (0.119)	0.5%	--	--	0.019 (0.049)	0.4%	0.011 (0.027)	0.2%	0.016 (0.041)	0.3%	0.010 (0.025)	0.2%	0.013 (0.034)	0.1%
Seascape Urban	1.39	3.61	0.001 (0.002)	0.1%	--	--	0.001 (0.002)	3.3%	0.001 (0.002)	3.%	0.001 (0.002)	4.7%	0.001 (0.002)	4.1%	--	--
Oceanside Seascape																
Nearshore Ocean	636.12	1,647.54	635.906 (1646.990)	99.9%	114.791 (297.306)	18.1%	167.83 (434.67)	26.4%	199.94 (517.84)	31.43%	235.88 (610.91)	37.1%	183.79 (476.01)	28.9%	433.90 (1,123.79)	68.2%
Oceanside Beach	12.87	33.32	7.807 (20.219)	60.7%	2.354 (6.098)	18.3%	1.073 (2.780)	22.2%	2.076 (5.378)	42.9%	2.279 (5.902)	47.0%	2.094 (5.424)	43.2%	5.366 (13.899)	41.7%
Oceanside Recreation	6.97	18.05	3.265 (8.457)	46.9%	0.623 (1.614)	9.0%	0.000 (0.001)	0.1%	0.000 (0.001)	0.1%	0.000 (0.000)	0.1%	0.000 (0.000)	0.1%	3.229 (8.364)	46.3%
Oceanside Residential/Commercial	20.12	52.10	6.193 (16.041)	30.8%	0.698 (1.808)	3.5%	2.982 (7.723)	22.2%	2.763 (7.156)	20.6%	3.093 (8.010)	23.0%	2.309 (5.980)	17.2%	3.616 (9.367)	18.0%
Oceanside Urban	4.94	12.80	1.482 (3.839)	30.0%	--	--	0.243 (0.630)	10.2%	0.128 (0.332)	5.3%	0.384 (0.995)	16.0%	0.350 (0.907)	14.6%	1.109 (2.871)	22.4%

Character Area	Total Area in the Geographic Analysis Area		Area Within the 1,312-Foot WTG GAA Viewshed [1]													
			New York Bight All Lease Areas		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544	
	Square Miles	Square Kilometers	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected
Landscape																
Inland Agriculture	21.27	55.09	0.014 (0.037)	0.1%	--	--	0.001 (0.001)	0.03%	0.004 (0.010)	0.2%	0.012 (0.030)	0.6%	--	--	0.002 (0.004)	0.0%
Inland Commercial Park	38.16	98.84	0.042 (0.108)	0.1%	0.000 (0.000)	0.00%	0.007 (0.018)	0.1%	0.009 (0.023)	0.1%	0.024 (0.063)	0.2%	0.007 (0.019)	0.1%	0.011 (0.028)	0.00%
Inland Industrial	30.08	77.92	0.243 (0.629)	0.8%	0.000 (0.000)	0.00%	0.000 (0.001)	0.00%	0.001 (0.002)	0.01%	0.001 (0.004)	0.02%	0.001 (0.001)	0.01%	0.241 (0.625)	0.08%
Inland Industrial Resource	18.55	48.04	0.276 (0.715)	1.5%	--	--	0.003 (0.007)	0.02%	0.007 (0.019)	0.1%	0.073 (0.189)	0.5%	0.001 (0.004)	0.01%	0.201 (0.522)	1.1%
Inland Military Site	20.39	52.82	0.244 (0.632)	1.2%	--	--	--	--	--	--	0.244 (0.632)	1.2%	--	--	--	--
Inland Natural Area	455.94	1180.89	0.469 (1.216)	0.1%	0.001 (0.003)	0.00%	0.013 (0.032)	0.00%	0.045 (0.116)	0.01%	0.429 (1.112)	0.1%	0.062 (0.162)	0.02%	0.029 (0.075)	0.00%
Inland Recreation	29.30	75.88	0.082 (0.212)	0.3%	--	--	0.004 (0.010)	0.1%	0.001 (0.004)	0.02%	0.059 (0.152)	0.8%	0.019 (0.049)	0.3%	0.020 (0.052)	0.01%
Inland Rural	25.60	66.30	0.114 (0.295)	0.4%	--	--	0.001 (0.003)	0.00%	0.002 (0.005)	0.01%	0.007 (0.018)	0.03%	0.000 (0.001)	0.00%	0.106 (0.273)	0.4%
Inland Suburban/Exurban Residential	691.95	1792.14	0.596 (1.543)	0.1%	0.110 (0.285)	0.02%	0.152 (0.394)	0.1%	0.159 (0.411)	0.1%	0.247 (0.640)	0.1%	0.088 (0.229)	0.04%	0.115 (0.298)	0.00%
Inland Urban	157.39	407.65	0.203 (0.525)	0.1%	--	--	0.007 (0.018)	0.1%	0.005 (0.014)	0.1%	0.006 (0.016)	0.1%	--	--	0.190 (0.492)	0.01%

Note: areas <0.00 square mile (0.00 square kilometer) = 0.64 acre or less.

Source: Argonne 2024

[1] Areas are not additive across leases due to overlap in lease area viewsheds. The area affected is a percentage of the total area GAA, not the individual lease area.

km^2 = square kilometers

Table H-14. Area of open ocean, seascape, and landscape character areas within the project area viewsheds for 853-foot WTGs

Character Area	Total Area in the Geographic Analysis Area		Area Within the 853-Foot WTG GAA Viewshed [1]													
			New York Bight All Lease Areas		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544	
	Square Miles	Square Kilometers	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected
Open Ocean	15,569.90	40,325.86	12,962.88 (33,573.71)	83.26%	8,948.43 (23,176.34)	57.5%	6,555.41 (16,978.44)	42.1%	6,868.38 (17,789.03)	44.11%	6,331.05 (16,397.35)	40.66%	6,625.01 (17,158.69)	42.55%	5,226.68 (13,537.03)	33.57%
Seascape																
Bayside Commercial Park	0.44	1.15	0.001 (0.002)	0.15%	--	--	<0.000 (0.001)	0.01%	<0.000 (0.000)	0.03%	<0.000 (0.000)	0.01%	<0.000 (0.000)	0.01%	<0.000 (0.001)	0.06%
Bayside Industrial	5.74	14.87	0.043 (0.011)	0.74%	--	--	--	--	--	--	<0.000 (0.000)	0.00%	--	--	0.043 (0.110)	0.74%
Bayside Industrial Resource	0.42	1.09	0.106 (0.275)	25.12%	--	--	--	--	--	--	0.001 (0.001)	0.13%	0.000 (0.001)	0.06%	0.106 (0.273)	24.99%
Bayside Military Site	0.58	1.49	0.004 (0.011)	0.74%	--	--	0.003 (0.008)	0.52%	<0.000 (0.001)	0.05%	<0.000 (0.000)	0.03%	--	--	--	0.38%

Character Area	Total Area in the Geographic Analysis Area		Area Within the 853-Foot WTG GAA Viewshed [1]													
			New York Bight All Lease Areas		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544	
	Square Miles	Square Kilometers	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected
Bayside Natural Upland	13.81	35.76	0.187 (0.485)	1.36%	0.001 (0.002)	0.01%	<0.000 (0.001)	0.00%	0.001 (0.003)	0.01%	0.003 (0.007)	0.02%	0.001 (0.002)	0.01%	0.183 (0.474)	1.33%
Bayside Natural Wetland	154.00	398.85	12.953 (33.547)	8.41%	0.005 (0.014)	0.00%	0.007 (0.018)	0.00%	0.029 (0.076)	0.02%	7.264 (18.814)	4.72%	0.268 (0.694)	0.17%	5.670 (14.685)	3.68%
Bayside Recreation	13.98	36.22	0.659 (1.708)	4.72%	0.001 (0.002)	0.01%	0.011 (0.027)	0.08%	0.006 (0.014)	0.04%	0.009 (0.023)	0.06%	0.003 (0.007)	0.02%	0.642 (1.664)	4.59%
Bayside Residential	71.73	185.78	0.995 (2.576)	1.39%	0.007 (0.019)	0.01%	0.020 (0.051)	0.03%	0.041 (0.106)	0.06%	0.134 (0.347)	0.19%	0.019 (0.049)	0.03%	0.836 (2.166)	1.17%
Bayside Urban	12.06	31.22	0.059 (0.153)	0.49%	<0.000 (0.000)	0.00%	0.002 (0.005)	0.02%	0.001 (0.002)	0.01%	0.028 (0.073)	0.24%	0.009 (0.024)	0.08%	0.029 (0.076)	0.24%
Bayside Waterbodies	419.31	1,086.01	87.471 (226.548)	20.86%	0.003 (0.008)	0.00%	0.009 (0.025)	0.00%	0.817 (2.115)	0.19%	5.698 (14.757)	1.36%	0.013 (0.035)	0.00%	81.360 (210.723)	19.40%
Seascape Residential	9.04	23.42	0.025 (0.066)	0.28%	--	--	--	--	0.004 (0.011)	0.05%	0.010 (0.026)	0.11%	0.005 (0.013)	0.05%	0.004 (0.011)	0.05%
Seascape Urban	1.39	3.61	0.001 (0.002)	0.05%	--	--	--	--	0.001 (0.002)	0.04%	0.001 (0.002)	0.05%	0.001 (0.002)	0.05%	--	--
Oceanside Seascape																
Nearshore Ocean	636.12	1,647.54	388.342 (1005.801)	61.05%	<0.000 (0.001)	0.00%	1.418 (3.672)	0.22%	85.274 (220.860)	13.41%	158.569 (410.691)	24.93%	20.966 (54.302)	3.30%	229.776 (595.118)	36.12%
Oceanside Beach	12.87	33.32	6.061 (15.699)	47.11%	0.062 (0.160)	0.48%	--	--	1.219 (3.157)	9.47%	2.079 (5.385)	16.16%	0.856 (2.216)	6.65%	3.910 (10.128)	30.40%
Oceanside Recreation	6.97	18.05	2.656 (6.897)	38.12%	0.002 (0.006)	0.04%	--	--	<0.000 (0.001)	<0.00%	0.000 (0.000)	0.00%	0.000 (0.000)	0.00%	2.655 (6.876)	38.10%
Oceanside Residential/Commercial	20.12	52.10	3.895 (10.088)	19.36%	0.051 (0.133)	0.26%	--	--	1.914 (4.958)	9.52%	2.186 (5.661)	10.86%	1.509 (3.907)	7.50%	1.555 (4.027)	7.73%
Oceanside Urban	4.94	12.80	0.979 (2.535)	19.81%	--	--	--	--	0.086 (0.222)	1.74%	0.209 (0.542)	4.24%	0.044 (0.115)	0.90%	0.761 (1.971)	15.40%
Landscape																
Inland Agriculture	21.27	55.09	0.002 (0.004)	0.01%	--	--	<0.000 (0.001)	0.00%	0.001 (0.003)	0.00%	0.000 (0.000)	0.00%	--	--	0.000 (0.000)	0.00%
Inland Commercial Park	38.16	98.84	0.020 (0.053)	0.05%	<0.00 (0.00)	0.0%	0.01 (0.01)	0.0%	0.005 (0.012)	0.01%	0.014 (0.036)	0.04%	0.004 (0.010)	0.01%	0.002 (0.004)	0.00%
Inland Industrial	30.08	77.92	0.048 (0.125)	0.16%	<0.00 (0.00)	0.0%	<0.00 (0.00)	0.0%	<0.000 (0.001)	0.00%	0.001 (0.002)	0.00%	<0.000 (0.001)	0.00%	0.047 (0.123)	0.16%
Inland Industrial Resource	18.55	48.04	0.213 (0.553)	1.15%	--	--	0.002 (0.005)	0.0%	0.003 (0.009)	0.02%	0.049 (0.127)	0.26%	0.000 (0.001)	0.00%	0.163 (0.423)	0.88%
Inland Military Site	20.39	52.82	0.003 (0.008)	0.02%	--	--	--	--	--	--	0.003 (0.008)	0.02%	--	--	--	--
Inland Natural Area	455.94	1,180.89	0.089 (0.231)	0.02%	<0.00 (0.00)	0.0%	0.006 (0.015)	0.0%	0.015 (0.038)	0.00%	0.066 (0.172)	0.01%	0.004 (0.010)	0.00%	0.019 (0.050)	0.00%
Inland Recreation	29.30	75.88	0.022 (0.058)	0.08%	--	--	0.002 (0.005)	0.01%	<0.000 (0.001)	0.00%	0.007 (0.019)	0.02%	0.001 (0.004)	0.00%	0.013 (0.034)	0.05%

Character Area	Total Area in the Geographic Analysis Area		Area Within the 853-Foot WTG GAA Viewshed [1]													
			New York Bight All Lease Areas		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544	
	Square Miles	Square Kilometers	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected	Square Miles (km^2)	Percent Affected
Inland Rural	25.60	66.30	0.035 (0.091)	0.14%	--	--	0.001 (0.002)	0.00%	<0.000 (0.001)	0.00%	0.002 (0.004)	0.01%	<0.000 (0.000)	0.00%	0.033 (0.086)	0.13%
Inland Suburban/Exurban Residential	691.95	1,792.14	0.309 (0.799)	0.04%	0.04 (0.11)	0.0%	0.083 (0.214)	0.01%	0.078 (0.201)	0.01%	0.115 (0.279)	0.02%	0.031 (0.079)	0.00%	0.082 (0.211)	0.01%
Inland Urban	157.39	407.65	0.138 (0.358)	0.09%	--	--	0.004 (0.010)	0.00%	0.001 (0.004)	0.00%	0.002 (0.006)	0.00%	--	--	0.132 (0.343)	0.08%

Note: areas <0.00 square miles (0.00 square kilometers) = 0.64 acres or less.
Source: Argonne 2024.
[1] Areas are not additive across leases due to overlap in lease area viewsheds. The area affected is a percentage of the total area GAA, not the individual lease area.
km^2 = square kilometers

Table H-15. Noticeable elements and impacts by open ocean, seascape, and landscape character area for the 1,312-foot WTGs

Noticeable Elements Impacts	Open Ocean, Seascape, and Landscape Character Areas
R, AL, N, H, O, M, Y Prominence 6	**Open Ocean Character Area**: Ocean
R, AL, N, H, O, M Prominence 5	**Open Ocean Character Area:** Ocean **Seascape Character Areas:** Bayside Natural Wetland, Bayside Residential, Bayside Waterbodies, Nearshore Ocean, Oceanside Beach, Oceanside Recreation, Oceanside Residential (NY: Ocean Beach, Fire Island, Saltaire)
R, AL, N, H Prominence 3–4	**Open Ocean Character Area:** Ocean **Seascape Character Areas:** Bayside Commercial Park, Bayside Industrial, Bayside Industrial Resource, Bayside Natural Upland, Bayside Natural Wetland, Bayside Recreation, Bayside Residential, Bayside Urban, Bayside Waterbodies, Seascape Residential, Seascape Urban, Nearshore Ocean, Oceanside Beach, Oceanside Recreation, Oceanside Residential/Commercial, Oceanside Urban (NY: Brookhaven, Islip, Massapequa Park, Long Beach, Jones Beach. NJ: Beach Haven, Long Beach, Barnegat) **Landscape Character Areas:** Inland Commercial Park, Inland Industrial, Inland Industrial Resource, Inland Natural Area, Inland Recreation, Inland Suburban/Exurban Residential, Inland Urban (NY: Islandia, Islip, Brookhaven, Babylon. NJ: Barnegat Township)
R Prominence 1–2	**Open Ocean Character Area:** Ocean **Seascape Character Areas:** Bayside Commercial Park, Bayside Industrial, Bayside Industrial Resource, Bayside Natural Upland, Bayside Natural Wetland, Bayside Recreation, Bayside Residential, Bayside Urban, Bayside Waterbodies, Seascape Residential, Seascape Urban, Nearshore Ocean, Oceanside Beach, Oceanside Recreation, Oceanside Residential/Commercial, Oceanside Urban (NY: Lawrence, Westhampton Beach, Atlantic Beach, Rockaway Beach, Quogue. NJ: Brigantine, Atlantic City, Monmouth Beach, Highlands, Belmar, Bay Head, Mantoloking, Point Pleasant Beach Borough) **Landscape Character Areas:** Inland Agriculture, Inland Commercial Park, Inland Industrial, Inland Industrial Resource, Inland Military Site, Inland Natural Area, Inland Recreation, Inland Rural, Inland Suburban/Exurban Residential, Inland Urban (NY: Huntington, Southampton. NJ: Barnegat Township, Egg Harbor Township, Berkeley Township, Brick Township, Point Pleasant Beach Borough)

R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, Y = yellow tower base color.
Prominence: 0 = Not visible. 1 = Visible only after extended study; otherwise not visible. 2 = Visible when viewing in general direction of the wind farm; otherwise likely to be missed by casual observer. 3 = Visible after brief glance in general direction of the wind farm; unlikely to be missed by casual observer. 4 = Plainly visible; could not be missed by casual observer, but does not strongly attract visual attention or dominate view. 5 = Strongly attracts viewers' attention to the wind farm; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 = Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV

Table H-16. Noticeable elements and impacts by open ocean, seascape, and landscape character area for the 853-foot WTGs

Noticeable Elements Impacts	Open Ocean, Seascape, and Landscape Character Areas
R, AL, N, H, O, M, Y Prominence 6	**Open Ocean Character Area:** Ocean
R, AL, N, H, O Prominence 5	**Open Ocean Character Area:** Ocean **Seascape Character Areas:** Bayside Natural Wetland, Bayside Residential, Bayside Waterbodies, Nearshore Ocean, Oceanside Beach, Oceanside Recreation, Oceanside Residential/Commercial (NY: Fire Island, Saltaire, Davis Park.)
R, AL, N, H Prominence 3–4	**Open Ocean Character Area:** Ocean **Seascape Character Areas:** Bayside Natural Wetland, Bayside Residential, Bayside Waterbodies, Nearshore Ocean, Oceanside Beach, Oceanside Recreation, Oceanside Residential/Commercial (NY: Fire Island, Saltaire, Davis Park.)
R Prominence 1–2	**Open Ocean Character Area**: Ocean **Seascape Character Areas:** Bayside Commercial Park, Bayside Industrial, Bayside Industrial Resource, Bayside Natural Wetland, Bayside Natural Upland, Bayside Recreation, Bayside Residential, Bayside Urban, Bayside Waterbodies, Seascape Residential, Seascape Urban, Nearshore Ocean, Oceanside Beach, Oceanside Recreation, Oceanside Residential/Commercial, Oceanside Urban (NY: Long Beach, Jones Beach, Islip, Mastic Beach, Babylon, Brookhaven. NJ: Beach Haven, Long Beach Island, Surf City) **Landscape Character Areas:** Inland Agriculture, Inland Commercial Park, Inland Industrial, Inland, Industrial Resource, Inland Natural Area, Inland Recreation, Inland Rural Inland Suburban/Exurban Residential, Inland Urban (NY: Massapequa, Patchogue, Islip, Babylon, Brookhaven. NJ: Barnegat Township Tuckerton Borough)

R = rotor, AL = aviation light, N = nacelle, H = hub, O = OSS, M = mid-tower light, Y = yellow tower base color.
Prominence: 0 = Not visible. 1 = Visible only after extended study; otherwise not visible. 2 = Visible when viewing in general direction of the wind farm; otherwise likely to be missed by casual observer. 3 = Visible after brief glance in general direction of the wind farm; unlikely to be missed by casual observer. 4 = Plainly visible; could not be missed by casual observer, but does not strongly attract visual attention or dominate view. 5 = Strongly attracts viewers' attention to the wind farm; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 = Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV

Table H-17. 1,312-foot WTGs scale of change and prominence for open ocean, seascape, and landscape[1]

Scale of Change and Prominence Effects	Open Ocean, Seascape, and Landscape	One Project												Six Projects	
		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544		New York Bight	
		Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Geographic Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)
Large Scale of Change and Prominence of 5 or 6	**Open Ocean Character Area:**														
	Open Ocean	9,416.28 (24,388.1)	3,299.03 (8,544.4)	9,681.22 (25,074.3)	3,406.70 (8,823.3)	9,957.53 (25,789.9)	3,704.96 (9,595.8)	9,062.22 (23,471.1)	3,490.03 (9,039.1)	9,447.28 (24,468.4)	3,464.63 (8,973.4)	7,289.92 (18,880.8)	2,932.73 (7,595.7)	15,569.90 (40,325.9)	8,828.66 (22,866.1)
	Seascape Character Areas:														
	Bayside Natural Wetland	-	-	-	-	-	-	-	-	-	-	46.78 (121.2)	0.59 (1.5)	154.00 (398.8)	0.59 (1.5)
	Bayside Residential	-	-	-	-	-	-	-	-	-	-	48.63 (126.0)	0.03 (0.1)	71.73 (185.8)	0.04 (0.1)
	Bayside Waterbodies	-	-	-	-	-	-	-	-	-	-	257.62 (667.2)	14.80 (38.3)	419.31 (1,086.0)	14.80 (38.3)
	Nearshore Ocean	-	-	-	-	-	-	-	-	-	-	450.73 (1,167.4)	86.72 (224.6)	636.12 (1,647.5)	86.72 (224.6)
	Oceanside Beach	-	-	-	-	-	-	-	-	-	-	8.86 (22.9)	0.87 (2.2)	12.87 (33.3)	0.91 (2.4)
	Oceanside Recreation	-	-	-	-	-	-	-	-	-	-	6.95 (18.0)	0.46 (1.2)	6.97 (18.0)	0.48 (1.2)
	Oceanside Residential/Commercial	-	-	-	-	-	-	-	-	-	-	13.13 (34.0)	0.67 (1.7)	20.12 (52.1)	0.72 (1.9)
Medium Scale of Change and Prominence of 3 or 4	**Open Ocean Character Area:**														
	Open Ocean	9,416.28 (24,388.1)	2,382.34 (6,170.2)	9,681.22 (25,074.3)	2,422.73 (6,274.8)	9,957.53 (25,789.9)	2,480.77 (6,425.2)	9,062.22 (23,471.1)	2,226.57 (5,766.8)	9,447.28 (24,468.4)	2,446.93 (6,337.5)	7,289.92 (18,880.8)	1,782.05 (4,615.5)	15,569.90 (40,325.9)	3,297.72 (8,541.1)
	Bayside Seascape Character Areas:														
	Bayside Commercial Park	-	-	-	-	-	-	-	-	-	-	0.29 (0.7)	0.00 (0.0)	0.44 (1.1)	0.00 (0.0)
	Bayside Industrial	-	-	-	-	-	-	-	-	-	-	3.74 (9.7)	0.05 (0.1)	5.74 (14.9)	0.05 (0.1)
	Bayside Industrial Resource	-	-	-	-	-	-	-	-	-	-	0.28 (0.7)	0.08 (0.2)	0.42 (1.1)	0.08 (0.2)
	Bayside Natural Upland	-	-	-	-	-	-	2.90 (7.5)	0.00 (0.0)	2.06 (5.3)	-	11.10 (28.8)	0.19 (0.5)	13.81 (35.8)	0.20 (0.5)
	Bayside Natural Wetland	-	-	-	-	-	-	109.21 (282.9)	13.82 (35.8)	84.68 (219.3)	-	46.78 (121.2)	13.54 (35.1)	154.00 (398.8)	27.49 (71.2)
	Bayside Recreation	-	-	-	-	-	-	2.44 (6.3)	0.01 (0.0)	0.66 (1.7)	-	11.18 (29.0)	0.82 (2.1)	13.98 (36.2)	0.84 (2.2)
	Bayside Residential	-	-	-	-	-	-	28.93 (74.9)	0.16 (0.4)	17.25 (44.7)	-	48.63 (126.0)	1.01 (2.6)	71.73 (185.8)	1.25 (3.2)
	Bayside Urban	-	-	-	-	-	-	3.56 (9.2)	0.00 (0.0)	3.30 (8.5)	-	5.63 (14.6)	0.05 (0.1)	12.06 (31.2)	0.05 (0.1)
	Bayside Waterbodies	-	-	-	-	-	-	162.81 (421.7)	25.04 (64.8)	129.83 (336.3)	-	257.62 (667.2)	94.45 (244.6)	419.31 (1,086.0)	120.19 (311.3)
	Seascape Residential	-	-	-	-	-	-	2.05 (5.3)	0.00 (0.0)	1.70 (4.4)	-	7.46 (19.3)	0.01 (0.0)	9.04 (23.4)	0.01 (0.0)
	Seascape Urban	-	-	-	-	-	-	0.02 (0.0)	0.00 (0.0)	0.02 (0.0)	-	1.37 (3.6)		1.39 (3.6)	0.00 (0.0)
	Oceanside Seascape Character Areas:														
	Nearshore Ocean	-	-	-	-	225.62 (584.4)	31.82 (82.4)	247.02 (639.8)	130.46 (337.9)	208.33 (539.6)	-	450.73 (1,167.4)	119.93 (310.6)	636.12 (1,647.5)	250.39 (648.5)
	Oceanside Beach	-	-	-	-	-	-	4.01 (10.4)	1.28 (3.3)	3.81 (9.9)	-	8.86 (22.9)	2.56 (6.6)	12.87 (33.3)	3.93 (10.2)
	Oceanside Recreation	-	-	-	-	-	-	0.01 (0.0)	0.00 (0.0)	0.01 (0.0)	-	6.95 (18.0)	2.35 (6.1)	6.97 (18.0)	2.37 (6.1)
	Oceanside Residential/Commercial	-	-	-	-	-	-	9.86 (25.5)	1.55 (4.0)	7.15 (18.5)	-	13.13 (34.0)	0.27 (0.7)	20.12 (52.1)	1.85 (4.8)
	Oceanside Urban	-	-	-	-	-	-	1.40 (3.6)	0.03 (0.1)	1.32 (3.4)	-	3.82 (9.9)	0.25 (0.7)	4.94 (12.8)	0.28 (0.7)
	Landscape Character Areas:														
	Inland Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Inland Commercial Park	-	-	-	-	-	-	10.08 (26.1)	0.00 (0.0)	1.76 (4.6)	-	28.29 (73.3)	0.01 (0.0)	38.16 (98.8)	0.01 (0.0)
	Inland Industrial	-	-	-	-	-	-	-	-	-	-	23.87 (61.8)	0.24 (0.6)	30.08 (77.9)	0.24 (0.6)
	Inland Industrial Resource	-	-	-	-	-	-	-	-	-	-	5.94 (15.4)	0.15 (0.4)	18.55 (48.0)	0.15 (0.4)
	Inland Natural Area	-	-	-	-	-	-	296.52 (768.0)	0.03 (0.1)	44.47 (115.2)	-	161.28 (417.7)	0.01 (0.0)	455.94 (1,180.9)	0.04 (0.1)

Scale of Change and Prominence Effects	Open Ocean, Seascape, and Landscape	One Project												Six Projects	
		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544		New York Bight	
		Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Geographic Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)
	Inland Recreation	-	-	-	-	-	-	-	-	-	-	24.79 (64.2)	0.00 (0.0)	29.30 (75.9)	0.00 (0.0)
	Inland Suburban/Exurban Residential	-	-	-	-	-	-	131.92 (341.7)	0.00 (0.0)	39.31 (101.8)	-	569.25 (1,474.3)	0.03 (0.1)	691.83 (1,791.8)	0.14 (0.4)
	Inland Urban	-	-	-	-	-	-	-	-	-	-	122.51 (317.3)	0.07 (0.2)	157.39 (407.6)	0.07 (0.2)
Small Scale of Change and Prominence of 1 or 2	**Open Ocean Character Area:**														
	Open Ocean	9,416.28 (24,388.1)	3,267.06 (8,461.7)	9,681.22 (25,074.3)	3,158.14 (8,179.6)	9,957.53 (25,789.9)	3,083.03 (7,985.0)	9,062.22 (23,471.1)	2,852.34 (7,387.5)	9,447.28 (24,468.4)	3,099.92 (8,028.8)	7,289.92 (18,880.8)	2,130.04 (5,516.8)	15,569.90 (40,325.9)	3,443.52 (8,918.7)
	Seascape Character Areas:														
	Bayside Commercial Park	-	-	0.32 (0.8)	0.00 (0.0)	0.17 (0.4)	0.00 (0.0)	0.18 (0.5)	0.00 (0.0)	0.15 (0.4)	0.00 (0.0)	0.29 (0.7)	-	0.44 (1.1)	0.00 (0.0)
	Bayside Industrial	-	-	-	-	-	-	0.02 (0.1)	0.00 (0.0)	0.02 (0.1)	0.00 (0.0)	3.74 (9.7)	0.00 (0.0)	5.74 (14.9)	0.00 (0.0)
	Bayside Industrial Resource	-	-	-	-	-	-	0.14 (0.4)	0.00 (0.0)	0.14 (0.4)	0.00 (0.0)	0.28 (0.7)	0.03 (0.1)	0.42 (1.1)	0.03 (0.1)
	Bayside Military Site	-	-	0.29 (0.7)	0.04 (0.1)	0.29 (0.7)	0.03 (0.1)	0.27 (0.7)	0.03 (0.1)	-	-	0.58 (1.5)	0.03 (0.1)	0.58 (1.5)	0.04 (0.1)
	Bayside Natural Upland	1.49 (3.9)	0.01 (0.0)	2.53 (6.5)	0.00 (0.0)	2.72 (7.0)	0.00 (0.0)	2.90 (7.5)	0.01 (0.0)	2.06 (5.3)	0.00 (0.0)	11.10 (28.8)	0.23 (0.6)	13.81 (35.8)	0.24 (0.6)
	Bayside Natural Wetland	10.59 (27.4)	0.29 (0.8)	22.26 (57.7)	0.07 (0.2)	64.09 (166.0)	7.37 (19.1)	109.21 (282.9)	37.55 (97.3)	84.68 (219.3)	18.08 (46.8)	46.78 (121.2)	0.04 (0.1)	154.00 (398.8)	37.90 (98.1)
	Bayside Recreation	1.67 (4.3)	0.01 (0.0)	1.89 (4.9)	0.02 (0.0)	1.54 (4.0)	0.02 (0.0)	2.44 (6.3)	0.03 (0.1)	0.66 (1.7)	0.01 (0.0)	11.18 (29.0)	0.05 (0.1)	13.98 (36.2)	0.09 (0.2)
	Bayside Residential	3.72 (9.6)	0.10 (0.3)	21.24 (55.0)	0.12 (0.3)	24.86 (64.4)	0.29 (0.8)	28.93 (74.9)	0.42 (1.1)	17.25 (44.7)	0.19 (0.5)	48.63 (126.0)	0.08 (0.2)	71.73 (185.8)	0.59 (1.5)
	Bayside Urban	0.21 (0.5)	0.00 (0.0)	0.68 (1.8)	0.00 (0.0)	0.39 (1.0)	0.00 (0.0)	3.56 (9.2)	0.06 (0.2)	3.30 (8.5)	0.05 (0.1)	5.63 (14.6)	0.01 (0.0)	12.06 (31.2)	0.07 (0.2)
	Bayside Waterbodies	87.07 (225.5)	0.99 (2.6)	82.74 (214.3)	0.61 (1.6)	132.74 (343.8)	16.38 (42.4)	162.81 (421.7)	33.71 (87.3)	129.83 (336.3)	13.27 (34.4)	257.62 (667.2)	15.20 (39.4)	419.31 (1,086.0)	49.08 (127.1)
	Seascape Residential	-	-	3.50 (9.1)	0.02 (0.0)	2.33 (6.0)	0.01 (0.0)	2.05 (5.3)	0.02 (0.0)	1.70 (4.4)	0.01 (0.0)	7.46 (19.3)	0.00 (0.0)	9.04 (23.4)	0.03 (0.1)
	Seascape Urban	-	-	0.02 (0.0)	0.00 (0.0)	0.02 (0.0)	0.00 (0.0)	0.02 (0.0)	-	0.02 (0.0)	0.00 (0.0)	1.37 (3.6)	-	1.39 (3.6)	-
	Oceanside Seascape Character Areas:														
	Nearshore Ocean	155.90 (403.8)	114.77 (297.3)	196.83 (509.8)	167.80 (434.6)	225.62 (584.4)	168.08 (435.3)	247.02 (639.8)	105.41 (273.0)	208.33 (539.6)	183.76 (475.9)	450.73 (1,167.4)	227.24 (588.6)	636.12 (1,647.5)	298.52 (773.2)
	Oceanside Beach	4.34 (11.2)	2.32 (6.0)	2.02 (5.2)	1.09 (2.8)	3.77 (9.8)	2.09 (5.4)	4.01 (10.4)	1.02 (2.6)	3.81 (9.9)	2.11 (5.5)	8.86 (22.9)	1.95 (5.1)	12.87 (33.3)	2.99 (7.7)
	Oceanside Recreation	1.75 (4.5)	0.63 (1.6)	0.01 (0.0)	0.00 (0.0)	0.01 (0.0)	0.00 (0.0)	0.01 (0.0)	0.00 (0.0)	0.01 (0.0)	0.00 (0.0)	6.95 (18.0)	0.43 (1.1)	6.97 (18.0)	0.43 (1.1)
	Oceanside Residential/Commercial	2.18 (5.7)	0.70 (1.8)	9.36 (24.3)	3.01 (7.8)	9.13 (23.6)	2.80 (7.3)	9.86 (25.5)	1.57 (4.1)	7.15 (18.5)	2.34 (6.1)	13.13 (34.0)	2.72 (7.0)	20.12 (52.1)	3.70 (9.6)
	Oceanside Urban	-	-	1.02 (2.6)	0.25 (0.6)	0.38 (1.0)	0.12 (0.3)	1.40 (3.6)	0.36 (0.9)	1.32 (3.4)	0.35 (0.9)	3.82 (9.9)	0.86 (2.2)	4.94 (12.8)	1.21 (3.1)
	Landscape Character Areas:														
	Inland Agriculture	-	-	0.37 (1.0)	0.00 (0.0)	0.35 (0.9)	0.00 (0.0)	1.63 (4.2)	0.01 (0.0)	-	-	19.64 (50.9)	0.00 (0.0)	21.27 (55.1)	0.01 (0.0)
	Inland Commercial Park	0.09 (0.2)	0.00 (0.0)	4.70 (12.2)	0.01 (0.0)	4.05 (10.5)	0.01 (0.0)	10.08 (26.1)	0.02 (0.1)	1.76 (4.6)	0.01 (0.0)	28.29 (73.3)	0.00 (0.0)	38.16 (98.8)	0.03 (0.1)
	Inland Industrial	0.02 (0.1)	0.00 (0.0)	0.28 (0.7)	0.00 (0.0)	0.67 (1.7)	0.00 (0.0)	5.09 (13.2)	0.00 (0.0)	0.27 (0.7)	0.00 (0.0)	23.87 (61.8)	0.00 (0.0)	30.08 (77.9)	0.01 (0.0)
	Inland Industrial Resource	-	-	2.66 (6.9)	0.00 (0.0)	6.04 (15.6)	0.01 (0.0)	12.67 (32.8)	0.07 (0.2)	2.85 (7.4)	0.00 (0.0)	5.94 (15.4)	0.05 (0.1)	18.55 (48.0)	0.12 (0.3)
	Inland Military Site	-	-	-	-	-	-	14.73 (38.1)	0.24 (0.6)	-	-	-	-	20.39 (52.8)	0.24 (0.6)
	Inland Natural Area	0.24 (0.6)	0.00 (0.0)	33.84 (87.6)	0.01 (0.0)	125.28 (324.5)	0.05 (0.1)	296.52 (768.0)	0.41 (1.0)	44.47 (115.2)	0.06 (0.2)	161.28 (417.7)	0.02 (0.0)	455.94 (1,180.9)	0.43 (1.1)
	Inland Recreation	-	-	1.64 (4.3)	0.00 (0.0)	0.52 (1.3)	0.00 (0.0)	2.66 (6.9)	0.06 (0.2)	0.84 (2.2)	0.02 (0.0)	24.79 (64.2)	0.02 (0.0)	29.30 (75.9)	0.08 (0.2)
	Inland Rural	-	-	0.68 (1.8)	0.00 (0.0)	2.66 (6.9)	0.00 (0.0)	20.29 (52.5)	0.01 (0.0)	0.54 (1.4)	0.00 (0.0)	5.31 (13.7)	0.11 (0.3)	25.60 (66.3)	0.11 (0.3)
	Inland Suburban/Exurban Residential	11.88 (30.8)	0.11 (0.3)	73.38 (190.1)	0.15 (0.4)	82.67 (214.1)	0.16 (0.4)	131.92 (341.7)	0.25 (0.6)	39.31 (101.8)	0.09 (0.2)	569.25 (1,474.3)	0.08 (0.2)	691.83 (1,791.8)	0.45 (1.2)
	Inland Urban	-	-	3.81 (9.9)	0.01 (0.0)	2.67 (6.9)	0.01 (0.0)	4.20 (10.9)	0.01 (0.0)	-	-	122.51 (317.3)	0.12 (0.3)	157.39 (407.6)	0.13 (0.3)

[1] Area measures represent totals by noticeable elements in the viewshed. Areas that are <0.00 sq miles (0.00 sq KM) are 0.64 acres or less.

km² = square kilometers

Table H-18. 853-foot WTGs scale of change and prominence for open ocean, seascape, and landscape[1]

Scale of Change and Prominence Effects	Open Ocean, Seascape, and Landscape	One Project												Six Projects	
		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544		New York Bight	
		Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Geographic Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)
Large Scale of Change and Prominence of 5 or 6	**Open Ocean Character Area:**														
	Open Ocean	9,416.28 (24,388.1)	2,978.23 (7,713.6)	9,681.22 (25,074.3)	3,134.97 (8,119.5)	9,957.53 (25,789.9)	3,454.33 (8,946.7)	9,062.22 (23,471.1)	3,203.01 (8,295.8)	18,894.57 (48,936.7)	6,438.71 (16,676.2)	7,289.92 (18,880.8)	2,713.65 (7,028.3)	15,569.90 (40,325.9)	8,356.44 (21,643.1)
	Seascape Character Areas:														
	Bayside Waterbodies	-	-	-	-	-	-	-	-	-	-	257.62 (667.2)	0.00 (0.0)	419.31 (1,086.0)	0.00 (0.0)
	Nearshore Ocean	-	-	-	-	-	-	-	-	-	-	450.73 (1,167.4)	66.04 (171.1)	636.12 (1,647.5)	66.04 (171.1)
	Oceanside Beach	-	-	-	-	-	-	-	-	-	-	8.86 (22.9)	0.41 (1.1)	12.87 (33.3)	0.41 (1.1)
	Oceanside Recreation	-	-	-	-	-	-	-	-	-	-	6.95 (18.0)	0.18 (0.5)	6.97 (18.0)	0.18 (0.5)
	Oceanside Residential/Commercial	-	-	-	-	-	-	-	-	-	-	13.13 (34.0)	0.46 (1.2)	20.12 (52.1)	0.48 (1.2)
Medium Scale of Change and Prominence of 3 or 4	**Open Ocean Character Area:**														
	Open Ocean	9,416.28 (24,388.1)	507.07 (1,313.3)	9,681.22 (25,074.3)	461.62 (1,195.6)	9,957.53 (25,789.9)	448.55 (1,161.7)	9,062.22 (23,471.1)	480.04 (1,243.3)	18,894.57 (48,936.7)	874.63 (2,265.3)	7,289.92 (18,880.8)	367.05 (950.6)	15,569.90 (40,325.9)	776.94 (2,012.3)
	Seascape Character Areas:														
	Bayside Natural Wetland	-	-	-	-	-	-	-	-	-	-	46.78 (121.2)	0.75 (1.9)	154.00 (398.8)	0.75 (1.9)
	Bayside Residential	-	-	-	-	-	-	-	-	-	-	48.63 (126.0)	0.07 (0.2)	71.73 (185.8)	0.07 (0.2)
	Bayside Waterbodies	-	-	-	-	-	-	-	-	-	-	257.62 (667.2)	19.39 (50.2)	419.31 (1,086.0)	19.39 (50.2)
	Nearshore Ocean	-	-	-	-	-	-	-	-	-	-	450.73 (1,167.4)	34.41 (89.1)	636.12 (1,647.5)	34.41 (89.1)
	Oceanside Beach	-	-	-	-	-	-	-	-	-	-	8.86 (22.9)	0.70 (1.8)	12.87 (33.3)	0.70 (1.8)
	Oceanside Recreation	-	-	-	-	-	-	-	-	-	-	6.95 (18.0)	0.25 (0.6)	6.97 (18.0)	0.25 (0.6)
	Oceanside Residential/Commercial	-	-	-	-	-	-	-	-	-	-	13.13 (34.0)	0.20 (0.5)	20.12 (52.1)	0.21 (0.5)
Small Scale of Change and Prominence of 1 or 2	**Open Ocean Character Area:**														
	Open Ocean	9,416.28 (24,388.1)	2,913.06 (7,544.8)	9,681.22 (25,074.3)	2,958.82 (7,663.3)	9,957.53 (25,789.9)	2,965.50 (7,680.6)	9,062.22 (23,471.1)	2,648.01 (6,858.3)	18,894.57 (48,936.7)	5,936.68 (15,375.9)	7,289.92 (18,880.8)	2,145.98 (5,558.1)	15,569.90 (40,325.9)	3,829.50 (9,918.4)
	Bayside Seascape Character Areas:														
	Bayside Commercial Park	-	-	0.32 (0.8)	0.00 (0.0)	0.17 (0.4)	0.00 (0.0)	0.18 (0.5)	0.00 (0.0)	0.30 (0.8)	0.00 (0.0)	0.29 (0.7)	0.00 (0.0)	0.44 (1.1)	0.00 (0.0)
	Bayside Industrial	-	-	-	-	-	-	0.02 (0.1)	0.00 (0.0)	0.05 (0.1)	-	3.74 (9.7)	0.04 (0.1)	5.74 (14.9)	0.04 (0.1)
	Bayside Industrial Resource	-	-	-	-	-	-	0.14 (0.4)	0.00 (0.0)	0.28 (0.7)	0.00 (0.0)	0.28 (0.7)	0.11 (0.3)	0.42 (1.1)	0.11 (0.3)
	Bayside Military Site	-	-	0.29 (0.7)	0.00 (0.0)	0.29 (0.7)	0.00 (0.0)	0.27 (0.7)	0.00 (0.0)	-	-	0.58 (1.5)	0.00 (0.0)	0.58 (1.5)	0.00 (0.0)
	Bayside Natural Upland	1.49 (3.9)	0.00 (0.0)	2.53 (6.5)	0.00 (0.0)	2.72 (7.0)	0.00 (0.0)	2.90 (7.5)	0.00 (0.0)	4.13 (10.7)	0.00 (0.0)	11.10 (28.8)	0.19 (0.5)	13.81 (35.8)	0.19 (0.5)
	Bayside Natural Wetland	10.59 (27.4)	0.01 (0.0)	22.26 (57.7)	0.01 (0.0)	64.09 (166.0)	0.03 (0.1)	109.21 (282.9)	7.27 (18.8)	169.36 (438.6)	0.55 (1.4)	46.78 (121.2)	4.93 (12.8)	154.00 (398.8)	12.21 (31.6)
	Bayside Recreation	1.67 (4.3)	0.00 (0.0)	1.89 (4.9)	0.01 (0.0)	1.54 (4.0)	0.01 (0.0)	2.44 (6.3)	0.01 (0.0)	1.33 (3.4)	0.01 (0.0)	11.18 (29.0)	0.64 (1.7)	13.98 (36.2)	0.66 (1.7)
	Bayside Residential	3.72 (9.6)	0.01 (0.0)	21.24 (55.0)	0.02 (0.1)	24.86 (64.4)	0.04 (0.1)	28.93 (74.9)	0.13 (0.3)	34.49 (89.3)	0.04 (0.1)	48.63 (126.0)	0.77 (2.0)	71.73 (185.8)	0.93 (2.4)
	Bayside Urban	0.21 (0.5)	0.00 (0.0)	0.68 (1.8)	0.00 (0.0)	0.39 (1.0)	0.00 (0.0)	3.56 (9.2)	0.03 (0.1)	6.60 (17.1)	0.02 (0.0)	5.63 (14.6)	0.03 (0.1)	12.06 (31.2)	0.06 (0.2)
	Bayside Waterbodies	87.07 (225.5)	0.00 (0.0)	82.74 (214.3)	0.01 (0.0)	132.74 (343.8)	0.82 (2.1)	162.81 (421.7)	5.70 (14.8)	259.66 (672.5)	0.03 (0.1)	257.62 (667.2)	61.96 (160.5)	419.31 (1,086.0)	68.07 (176.3)
	Seascape Residential	-	-	3.50 (9.1)	0.01 (0.0)	2.33 (6.0)	0.00 (0.0)	2.05 (5.3)	0.01 (0.0)	3.40 (8.8)	0.01 (0.0)	7.46 (19.3)	0.00 (0.0)	9.04 (23.4)	0.03 (0.1)
	Seascape Urban	-	-	0.02 (0.0)	0.00 (0.0)	0.02 (0.0)	0.00 (0.0)	0.02 (0.0)	0.00 (0.0)	0.04 (0.1)	0.00 (0.0)	1.37 (3.6)	-	1.39 (3.6)	0.00 (0.0)
	Oceanside Seascape Character Areas:														
	Nearshore Ocean	155.90 (403.8)	0.00 (0.0)	196.83 (509.8)	1.42 (3.7)	225.62 (584.4)	85.26 (220.8)	247.02 (639.8)	158.56 (410.7)	416.65 (1,079.1)	41.90 (108.5)	450.73 (1,167.4)	129.32 (334.9)	636.12 (1,647.5)	287.88 (745.6)
	Oceanside Beach	4.34 (11.2)	0.06 (0.2)	2.02 (5.2)	0.80 (2.1)	3.77 (9.8)	1.23 (3.2)	4.01 (10.4)	2.10 (5.4)	7.62 (19.7)	1.71 (4.4)	8.86 (22.9)	2.81 (7.3)	12.87 (33.3)	4.98 (12.9)
	Oceanside Recreation	1.75 (4.5)	0.00 (0.0)	0.01 (0.0)	0.00 (0.0)	0.01 (0.0)	0.00 (0.0)	0.01 (0.0)	0.00 (0.0)	0.03 (0.1)	0.00 (0.0)	6.95 (18.0)	2.23 (5.8)	6.97 (18.0)	2.23 (5.8)

Scale of Change and Prominence Effects	Open Ocean, Seascape, and Landscape	One Project												Six Projects	
		OCS-A 0537		OCS-A 0538		OCS-A 0539		OCS-A 0541		OCS-A 0542		OCS-A 0544		New York Bight	
		Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Project Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)	Geographic Analysis Area Square Miles (km²)	Impact Area Square Miles (km²)
	Oceanside Residential/Commercial	2.18 (5.7)	0.05 (0.1)	9.36 (24.3)	0.82 (2.1)	9.13 (23.6)	1.94 (5.0)	9.86 (25.5)	2.21 (5.7)	14.30 (37.0)	3.04 (7.9)	13.13 (34.0)	0.90 (2.3)	20.12 (52.1)	3.25 (8.4)
	Oceanside Urban	-	-	1.02 (2.6)	0.06 (0.2)	0.38 (1.0)	0.09 (0.2)	1.40 (3.6)	0.21 (0.5)	2.63 (6.8)	0.09 (0.2)	3.82 (9.9)	0.76 (2.0)	4.94 (12.8)	0.98 (2.5)
	Landscape Character Areas:														
	Inland Agriculture	-	-	0.37 (1.0)	0.00 (0.0)	0.35 (0.9)	0.00 (0.0)	1.63 (4.2)	0.00 (0.0)	-	-	19.64 (50.9)	0.00 (0.0)	21.27 (55.1)	0.00 (0.0)
	Inland Commercial Park	0.09 (0.2)	0.00 (0.0)	4.70 (12.2)	0.00 (0.0)	4.05 (10.5)	0.00 (0.0)	10.08 (26.1)	0.01 (0.0)	3.52 (9.1)	0.01 (0.0)	28.29 (73.3)	0.00 (0.0)	38.16 (98.8)	0.02 (0.1)
	Inland Industrial	0.02 (0.1)	0.00 (0.0)	0.28 (0.7)	0.00 (0.0)	0.67 (1.7)	0.00 (0.0)	5.09 (13.2)	0.00 (0.0)	0.54 (1.4)	0.00 (0.0)	23.87 (61.8)	0.05 (0.1)	30.08 (77.9)	0.05 (0.1)
	Inland Industrial Resource	-	-	2.66 (6.9)	0.00 (0.0)	6.04 (15.6)	0.00 (0.0)	12.67 (32.8)	0.05 (0.1)	5.71 (14.8)	0.00 (0.0)	5.94 (15.4)	0.16 (0.4)	18.55 (48.0)	0.21 (0.6)
	Inland Military Site	-	-	-	-	-	-	14.73 (38.1)	0.00 (0.0)	-	-	5.67 (14.7)	-	20.39 (52.8)	0.00 (0.0)
	Inland Natural Area	0.24 (0.6)	0.00 (0.0)	33.84 (87.6)	0.01 (0.0)	125.28 (324.5)	0.01 (0.0)	296.52 (768.0)	0.07 (0.2)	88.95 (230.4)	0.01 (0.0)	161.28 (417.7)	0.02 (0.0)	455.94 (1,180.9)	0.09 (0.2)
	Inland Recreation	-	-	1.64 (4.3)	0.00 (0.0)	0.52 (1.3)	0.00 (0.0)	2.66 (6.9)	0.01 (0.0)	1.68 (4.3)	0.00 (0.0)	24.79 (64.2)	0.01 (0.0)	29.30 (75.9)	0.02 (0.1)
	Inland Rural	-	-	0.68 (1.8)	0.00 (0.0)	2.66 (6.9)	0.00 (0.0)	20.29 (52.5)	0.00 (0.0)	1.08 (2.8)	0.00 (0.0)	5.31 (13.7)	0.03 (0.1)	25.60 (66.3)	0.04 (0.1)
	Inland Suburban/Exurban Residential	11.88 (30.8)	0.04 (0.1)	73.38 (190.1)	0.08 (0.2)	82.67 (214.1)	0.08 (0.2)	131.92 (341.7)	0.11 (0.3)	78.62 (203.6)	0.06 (0.2)	569.25 (1,474.3)	0.08 (0.2)	691.83 (1,791.8)	0.31 (0.8)
	Inland Urban	-	-	3.81 (9.9)	0.00 (0.0)	2.67 (6.9)	0.00 (0.0)	4.20 (10.9)	0.00 (0.0)	-	-	122.51 (317.3)	0.13 (0.3)	157.39 (407.6)	0.14 (0.4)

[1] Area measures represent totals by noticeable elements in the viewshed. Areas that are <0.00 sq miles (0.00 sq KM) are 0.64 acres or less.
km² = square kilometers

H.3.1.4 Open Ocean, Seascape, and Landscape Impact Assessment Summary and Impact Levels

Table H-19 through Table H-32 summarize the effects from the offshore components of each lease area and all six NY Bight lease areas on sensitivity, magnitude, and visibility thresholds (Table H-8). The tables also present the impact levels for each character area based on the impact level definitions in Table H-8.

Lease areas farther from shore (i.e., OCS-A 0537 and OCS-A 0538) have less effect on seascape and landscape character areas because of their smaller perceptive scale, whereas lease areas nearer to shore (i.e., OCS-A 0544) have a greater perceptive scale and therefore a greater effect on oceanside seascape character type sense of place in limited areas of New York.

High to moderate magnitudes of visual impact would occur in the ocean-facing and bay-facing seascape character areas and diminish to moderate and minor as distance increases and screening effects increase from topography, structures, and vegetation. Nearshore Ocean is the largest and most vulnerable character area to change, outside of the Open Ocean. Medium to minor size or scale changes to character type sense of place would occur in all other seascape and landscape character areas. Impacts of the NY Bight projects on open ocean character, seascape character, and landscape character range from **negligible** to **major**.

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Table H-19. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0537 for 1,312-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0537	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Residential	X			X					X			•		X				X		Negligible	Same as Alternative B
Bayside Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Bayside Waterbodies	X			X				X				X		X				X		Minor	Same as Alternative B
Seascape Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					X		X				X		Minor	Same as Alternative B
Oceanside Beach	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Oceanside Residential/ Commercial	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Urban		X		X				X				--		X					X	Negligible	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			--		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] • = <0.64 acre, -- = not visible

Table H-20. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0538 for 1,312-foot WTGs

Character Area	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0538	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			X		X				X		Minor	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			X		X				X		Minor	Same as Alternative B
Bayside Natural Upland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X				X		X				X		Minor	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					X		X				X		Minor	Same as Alternative B
Oceanside Beach	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Oceanside Residential/ Commercial	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Urban		X		X				X				X		X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			•		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			•		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			•		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			•		X						Negligible	Same as Alternative B

[1] • = <0.64 acre, -- = not visible

Table H-21. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0539 for 1,312-foot WTGs

Character Area	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0539	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			X		X				X		Minor	Same as Alternative B
Bayside Natural Upland	X			X					X			•		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			•		X					X	Negligible	Same as Alternative B
Bayside Waterbodies	X			X				X				X		X				X		Minor	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					X		X				X		Minor	Same as Alternative B
Oceanside Beach	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Urban		X		X				X				X		X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			•		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			•		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			•		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			•		X					X	Negligible	Same as Alternative B

[1] • = <0.64 acre, -- = not visible

Table H-22. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0541 for 1,312-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)[1]	Low (1–2)	Unseen	OCS-A 0541	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			•		X				X		Negligible	Same as Alternative B
Bayside Industrial			X			X			X			•		X				X		Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			•		X				X		Negligible	Same as Alternative B
Bayside Military Site			X		X				X			X		X				X		Minor	Same as Alternative B
Bayside Natural Upland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X	X				X			X			Moderate	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X			X			X			X			Moderate	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			•		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X			X				X			X			Moderate	Same as Alternative B
Oceanside Beach	X			X				X		X				X			X			Moderate	Same as Alternative B
Oceanside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Oceanside Residential/Commercial	X			X				X			X			X			X			Moderate	Same as Alternative B
Oceanside Urban		X		X				X			X			X			X			Moderate	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			X		X				X		Minor	Same as Alternative B
Inland Commercial Park			X			X			X			X		X				X		Minor	Same as Alternative B
Inland Industrial			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			X		X				X		Minor	Same as Alternative B
Inland Military Site		X			X				X			X		X				X		Minor	Same as Alternative B
Inland Natural Area	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Rural	X				X				X			X		X				X	X	Minor	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			X		X				X	X	Minor	Same as Alternative B

[1] • = <0.64 acre, -- = not visible

Table H-23. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0542 for 1,312-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5-6)	Moderate (3-4)	Low (1-2)	Unseen	OCS-A 0542	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			•		X				X		Minor	Same as Alternative B
Bayside Military Site			X		X				X					X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			•		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X		X			X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X			X			X				X		Minor	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			•		X				X		Minor	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					X		X				X		Minor	Same as Alternative B
Oceanside Beach	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Recreation	X			X					X			•		X				X		Minor	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Urban		X		X				X				X		X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			•		X				X		Minor	Same as Alternative B
Inland Industrial			X			X			X			•		X				X		Minor	Same as Alternative B
Inland Industrial Resource		X				X			X			•		X				X		Minor	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] • = <0.64 acre, -- = not visible

Table H-24. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0544 for 1,312-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5-6)[1]	Moderate (3-4)[1]	Low (1-2)	Unseen	OCS-A 0544	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			•		X				X		Minor	Same as Alternative B
Bayside Industrial			X			X			X			X		X			X			Minor	Same as Alternative B
Bayside Industrial Resource			X			X			X			X		X			X			Minor	Same as Alternative B
Bayside Military Site			X		X				X			X		X				X		Minor	Same as Alternative B
Bayside Natural Upland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X			X			Moderate	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X			X			Moderate	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X			X			X		X				Moderate	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Oceanside Beach	X			X				X		X				X		X				Major	Same as Alternative B
Oceanside Recreation	X			X					X	X				X			X			Moderate	Same as Alternative B
Oceanside Residential/Commercial	X			X				X			X			X		X				Moderate	Same as Alternative B
Oceanside Urban		X		X				X			X			X			X			Moderate	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			•		X				X		Minor	Same as Alternative B
Inland Commercial Park			X			X			X			•		X			X			Minor	Same as Alternative B
Inland Industrial			X			X			X			•		X			X			Minor	Same as Alternative B
Inland Industrial Resource		X				X			X			•		X			X			Minor	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			•		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Rural	X				X				X			•		X				X		Minor	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			•		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			•		X				X		Minor	Same as Alternative B

[1] • = <0.64 acre; -- = not visible

Table H-25. Open ocean, seascape, and landscape character SLIA summary for six NY Bight Projects for 1,312-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	Six Projects	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Bayside Seascape																					
Bayside Commercial Park			X			X			X			•		X				X		Minor	Same as Alternative B
Bayside Industrial			X			X			X			X		X				X		Minor	Same as Alternative B
Bayside Industrial Resource			X			X			X			X		X				X		Minor	Same as Alternative B
Bayside Military Site			X		X				X			X		X				X		Minor	Same as Alternative B
Bayside Natural Upland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X	X				X		X	X			Moderate	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Moderate	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X		X				X			X			Moderate	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			•		X				X		Minor	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Oceanside Beach	X			X				X		X				X		X				Major	Same as Alternative B
Oceanside Recreation	X			X					X		X			X			X			Moderate	Same as Alternative B
Oceanside Residential/Commercial	X			X				X		X				X			X			Moderate	Same as Alternative B
Oceanside Urban		X		X				X			X			X			X			Moderate	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			X		X				X		Minor	Same as Alternative B
Inland Commercial Park			X			X			X			X		X				X		Minor	Same as Alternative B
Inland Industrial			X			X			X			X		X				X		Minor	Same as Alternative B
Inland Industrial Resource		X				X			X			X		X				X		Minor	Same as Alternative B
Inland Military Site		X			X				X			X		X				X		Minor	Same as Alternative B
Inland Natural Area	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Rural	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Suburban/Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			X		X				X		Minor	Same as Alternative B

[1] • = <0.64 acre;

Table H-26. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0537 for 853-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0537	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Bayside Waterbodies	X			X				X				--		X					X	Negligible	Same as Alternative B
Seascape Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					--		X					X	Negligible	Same as Alternative B
Oceanside Beach	X			X				X				--		X					X	Negligible	Same as Alternative B
Oceanside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				--		X					X	Negligible	Same as Alternative B
Oceanside Urban		X		X				X				--		X					X	Negligible	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X						X			--		X					X	Negligible	Same as Alternative B
Inland Industrial			X						X			--		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X							X			--		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/Exurban Residential	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] -- = not visible

Table H-27. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0538 for 853-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0538	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Bayside Waterbodies	X			X				X				--		X					X	Negligible	Same as Alternative B
Seascape Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					--		X					X	Negligible	Same as Alternative B
Oceanside Beach	X			X				X				--		X					X	Negligible	Same as Alternative B
Oceanside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				--		X					X	Negligible	Same as Alternative B
Oceanside Urban		X		X				X				--		X					X	Negligible	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			--		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/Exurban Residential	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] -- = not visible

Table H-28. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0539 for 853-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0539	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Bayside Seascape																					
Bayside Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Residential	X			X					X			•		X					X	Negligible	Same as Alternative B
Bayside Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Bayside Waterbodies	X			X				X				X		X				X		Minor	Same as Alternative B
Seascape Residential	X			X					X			•		X					X	Negligible	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					X		X				X		Minor	Same as Alternative B
Oceanside Beach	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Recreation	X			X					X			•		X					X	Negligible	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				X		X				X		Minor	Same as Alternative B
Oceanside Urban		X		X				X				X		X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			--		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/Exurban Residential	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] • = <0.64 acre; -- = not visible

Table H-29. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0541 for 853-foot WTGs

Character Area	Sensitivity: Susceptibility High	Sensitivity: Susceptibility Moderate	Sensitivity: Susceptibility Low	Sensitivity: Value High	Sensitivity: Value Moderate	Sensitivity: Value Low	Magnitude of Impact: Size and Scale of Change Large	Magnitude of Impact: Size and Scale of Change Medium	Magnitude of Impact: Size and Scale of Change Small	Magnitude of Impact: Geographic Extent Large	Magnitude of Impact: Geographic Extent Medium	Magnitude of Impact: Geographic Extent Small [1]	Magnitude of Impact: Duration & Reversibility Permanent	Magnitude of Impact: Duration & Reversibility Long Term	Magnitude of Impact: Duration & Reversibility Short Term	Visibility Threshold Rating High (5–6)	Visibility Threshold Rating Moderate (3–4)	Visibility Threshold Rating Low (1–2)	Visibility Threshold Rating Unseen	Impact Levels OCS-A 0541	Impact Levels Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			•		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			•		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X				X		X				X		Minor	Same as Alternative B
Seascape Residential	X			X					X			•		X				X	X	Minor	Same as Alternative B
Seascape Urban			X	X					X			•		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X				X			X				X		Moderate	Same as Alternative B
Oceanside Beach	X			X				X			X			X				X		Moderate	Same as Alternative B
Oceanside Recreation	X			X					X			•		X					X	Negligible	Same as Alternative B
Oceanside Residential/Commercial	X			X				X			X			X				X		Minor	Same as Alternative B
Oceanside Urban		X		X				X				X		X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			X		X				X		Minor	Same as Alternative B
Inland Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			•		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			•		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			•		X					X	Negligible	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] • = <0.64 acre; -- = not visible

Table H-30. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0542 for 853-foot WTGs

Character Area	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0542	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			--		X					X	Negligible	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Wetland	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Bayside Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Bayside Waterbodies	X			X				X				--		X					X	Negligible	Same as Alternative B
Seascape Residential	X			X					X			--		X					X	Negligible	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X					--		X					X	Negligible	Same as Alternative B
Oceanside Beach	X			X				X				--		X					X	Negligible	Same as Alternative B
Oceanside Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				--		X					X	Negligible	Same as Alternative B
Oceanside Urban		X		X				X				--		X					X	Negligible	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			--		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			--		X					X	Negligible	Same as Alternative B
Inland Industrial Resource		X				X			X			--		X					X	Negligible	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Recreation	X			X					X			--		X					X	Negligible	Same as Alternative B
Inland Rural	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Suburban/Exurban Residential	X				X				X			--		X					X	Negligible	Same as Alternative B
Inland Urban			X		X				X			--		X					X	Negligible	Same as Alternative B

[1] -- = not visible

Table H-31. Open ocean, seascape, and landscape character SLIA summary for OCS-A 0544 for 853-foot WTGs

	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility								
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	OCS-A 0544	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Seascape																					
Bayside Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			X		X				X		Minor	Same as Alternative B
Bayside Industrial Resource			X			X			X		X			X				X		Minor	Same as Alternative B
Bayside Military Site			X		X				X			--		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X			X			Moderate	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X			X			X			X			Moderate	Same as Alternative B
Seascape Residential	X			X					X			•		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			--		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Oceanside Beach	X			X				X			X			X			X			Moderate	Same as Alternative B
Oceanside Recreation	X			X					X	X				X			X			Moderate	Same as Alternative B
Oceanside Residential/Commercial	X			X				X				X		X			X			Moderate	Same as Alternative B
Oceanside Urban		X		X				X			X			X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			•		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Inland Industrial			X			X			X			X		X				X		Minor	Same as Alternative B
Inland Industrial Resource		X				X			X			X		X				X		Minor	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Rural	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Suburban/Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			X		X				X		Minor	Same as Alternative B

[1] • = <0.64 acre; -- = not visible

Table H-32. Open ocean, seascape, and landscape character SLIA summary for six NY Bight projects for 853-foot WTGs

	Sensitivity						Magnitude of Impact													Impact Levels	
	Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility			Visibility Threshold Rating					
Character Area	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small [1]	Permanent	Long Term	Short Term	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	Six Projects	Sub-alternatives C1 and C2
Open Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Bayside Seascape																					
Bayside Commercial Park			X			X			X			•		X					X	Negligible	Same as Alternative B
Bayside Industrial			X			X			X			X		X					X	Negligible	Same as Alternative B
Bayside Industrial Resource			X			X			X			X		X				X		Minor	Same as Alternative B
Bayside Military Site			X		X				X			X		X					X	Negligible	Same as Alternative B
Bayside Natural Upland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Natural Wetland	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Bayside Urban			X	X					X			X		X				X		Minor	Same as Alternative B
Bayside Waterbodies	X			X				X			X			X			X			Moderate	Same as Alternative B
Seascape Residential	X			X					X			X		X				X		Minor	Same as Alternative B
Seascape Urban			X	X					X			•		X					X	Negligible	Same as Alternative B
Oceanside Seascape																					
Nearshore Ocean	X			X			X			X				X		X				Major	Same as Alternative B
Oceanside Beach	X			X				X			X			X			X			Moderate	Same as Alternative B
Oceanside Recreation	X			X					X		X			X			X			Moderate	Same as Alternative B
Oceanside Residential/ Commercial	X			X				X			X			X			X			Moderate	Same as Alternative B
Oceanside Urban		X		X				X				X		X				X		Minor	Same as Alternative B
Landscape																					
Inland Agriculture		X		X					X			•		X					X	Negligible	Same as Alternative B
Inland Commercial Park			X			X			X			X		X				X		Minor	Same as Alternative B
Inland Industrial			X			X			X			X		X				X		Minor	Same as Alternative B
Inland Industrial Resource		X				X			X			X		X				X		Minor	Same as Alternative B
Inland Military Site		X			X				X			--		X					X	Negligible	Same as Alternative B
Inland Natural Area	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Recreation	X			X					X			X		X				X		Minor	Same as Alternative B
Inland Rural	X				X				X			•		X					X	Negligible	Same as Alternative B
Inland Suburban/ Exurban Residential	X				X				X			X		X				X		Minor	Same as Alternative B
Inland Urban			X		X				X			X		X				X		Minor	Same as Alternative B

[1] • = <0.64 acre; -- = not visible

H.3.2 Visual Impact Assessment (VIA)

H.3.2.1 Sensitivity

Impacts on people are considered in evaluating KOPs. The susceptibility of viewers to changes in views is a function of the activities in which the viewers are engaged and their attention or interest on the view. Visual receptors most susceptible to change generally include residents with views of the proposed project from their homes, people engaged in outdoor recreation whose attention is focused on the views, visitors to historic or culturally important sites where views are an important contributor to the experience, people who regard the visual environment as an asset to their community, and people traveling scenic highways, railroads, or other transport specifically for enjoyment of the views.

KOPs are generally selected to represent high value, highly susceptible viewpoints to evaluate impacts at these special places; therefore, it is not surprising that all the KOPs are highly sensitive. Table H-33 documents the susceptibility, value, and sensitivity of viewers at each KOP. Overall, residents, tourists, and visitors engaging in recreation at these viewpoints are highly susceptible to changes from the NY Bight projects due to their interest in ocean-facing views and the visual environment being an important asset to their community. It is noted that susceptibility may be variable for visitors based on the activities people are engaged in and the nuances of each location. For example, visitors at Lucy the Elephant have a higher susceptibility while in the howdah and viewing the open ocean, and a lower susceptibility while on the ground or inside the structure. Many of the KOPs have special local, state, or national designations that demonstrate their value. For all the KOPs, their expansive ocean-facing views define their experiential character, which contributes to their overall view value.

Table H-33. View value, susceptibility, and viewer sensitivity for each KOP

KOP[1]	Viewer Experience								
	View Value			Receptor Susceptibility			Viewer Sensitivity		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
KOP-02 Lucy the Elephant [1, 2]	X				X		X		
KOP-03 John Stafford Hall-Boardwalk [2]	X			X			X		
KOP-04 John Stafford Hall-Beach Entrance	X			X			X		
KOP-05 Jim Whelan Hall-Balcony [1, 2]	X				X		X		
KOP-06 Atlantic City Boardwalk-Ocean Casino Boardwalk View	X			X			X		
KOP-07 Atlantic City Boardwalk-Top of Ocean Casino [1]	X			X			X		
KOP-08A/B Beach Haven – daytime and nighttime [2]	X			X			X		
KOP-09 Barnegat Jetty	X			X			X		
KOP-10 Barnegat Lighthouse [1,2]	X			X			X		
KOP-11 US Life Saving Station #14 [1]	X			X			X		
KOP-12 Seaside Park Beach	X			X			X		

KOP[1]	Viewer Experience								
	View Value			Receptor Susceptibility			Viewer Sensitivity		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
KOP-13 Mantoloking [2]	X			X			X		
KOP-14 Bayhead	X			X			X		
KOP-15 Point Pleasant	X			X			X		
KOP-16 Ocean Grove	X			X			X		
KOP-17 Asbury Park Beach	X			X			X		
KOP-18 Allenhurst Residential Historic District [2]	X			X			X		
KOP-19 Navesink Twin Lights	X			X			X		
KOP-26 Fort Tilden [2]	X			X			X		
KOP-27 Magnolia Beach	X			X			X		
KOP-28 Jones Beach [2]	X			X			X		
KOP-29 Rudolph Oyster House	X				X		X		
KOP-30 Shinnecock Inlet [2]	X			X			X		
KOP-31 Westhampton Beach [2]	X			X			X		
KOP-32 Fire Island Lighthouse-Upper Deck [1, 2]	X			X			X		
KOP-33 Fire Island Lighthouse-Base	X			X			X		
KOP-35 Navesink Twin Lights Lighthouse [1, 2]	X			X			X		
KOP-36 Asbury Park Hall-Balcony [1, 2]	X			X			X		
KOP-37 Point O' Woods [2]	X			X			X		
KOP-38 Robert Moses Field 5	X			X			X		
KOP-39 Empire State Building Observation Deck [1, 2]	X			X			X		
KOP-40 Robert Moses Field-Nighttime [2]	X			X			X		
KOP-A Representative Recreational Fishing, Pleasure, and Tour Boat Area	X			X			X		
KOP-B Representative Commercial and Cruise Ship Shipping Lanes	X			X			X		

[1] Elevated viewpoint
[2] Simulation

H.3.2.2 Magnitude

The measure of magnitude of visual impacts is similar to that used for SLIA and is based on the size or scale of change, the geographic extent of its effects, and its duration and reversibility. Large-scale changes that introduce new, non-characteristic, discordant, or intrusive elements are more important than small changes or changes involving similar features already present within the view.

Size and scale of change and geographic extent is measured by a project's distances, horizontal FOVs, noticeable features based on their heights and EC, and visual contrasts. The analysis considers the introduction of WTGs and OSSs to an open ocean baseline. The scale, size, contrast, and prominence of change focuses on the:

- Arrangement of WTGs and OSSs in the view.
- Horizontal and vertical FOV scale of the wind turbine array, based on WTG and OSS size and number.
- Position of the array in the open ocean.
- Position of the array in the view.
- Wind turbine array's distance from the viewer.

Geographic extent is a measure of visibility, character-changing effects, scale, prominence, and visual contrasts reduce steadily with distance from the observation point and increase with elevated observer positions in comparison with the wind turbine array. Distance and observer elevation considerations are informed by the visual simulations (BOEM's NY Bight website: https://www.boem.gov/renewable-energy/state-activities/new-york-bight), EC calculations, horizontal FOV, and vertical FOV in undeveloped open ocean. The wind turbine array and nearest WTGs would be:

- Unavoidably dominant features in the boat and ship ocean view between 0 and 5 miles (0 and 8.0 kilometers) distance.
- Strongly pervasive features in the onshore to offshore view between 5 and 16 miles (8 and 25.75 kilometers) distance.
- Clearly visible features in the onshore to offshore view between 16 and 20 miles (25.75 and 45.1 kilometers) distance.
- Low on the horizon, but persistent features in the onshore to offshore view between 20 and 36.1 miles (45.1 and 58.1 kilometers) distance.
- Intermittently noticed features in the onshore to offshore view between 36.1 and 47.4 miles (58.1 and 76.3 kilometers) distance.
- Below the horizon beyond 47.4 miles (76.3 kilometers) distance.

Like duration and reversibility in the SLIA, this is a measure of the length of time over which the impact is likely to occur and the degree to which the pre-project conditions can be restored after decommissioning. Duration is recorded on an ordinal scale of short term (less than 5 years), long term (5–30 years), or considered permanent (more than 30 years). Reversibility is recorded on a scale of nonreversible, partially reversible, or fully reversible. In the assessment of impact level, duration and reversibility are considered together and recorded on a scale of good, fair, and poor, with good combining short duration with full reversibility, and poor combining permanent with nonreversible. A combination matrix can be found in Argonne 2024. Impact levels are recorded in the visual summary tables found in Section H.3.2.3.

Construction and installation involving moving and stationary visual feature contrasts to forms, lines, colors, and textures, scale, and prominence in formerly open seascape may have more effect on viewers than operational and decommissioning impacts, where the viewing context is existing WTGs and OSSs. Construction impacts would be temporary and include:

- Daytime and nighttime movement of installation vessels, cranes, and other equipment visible in the seascape in and around the lease area.
- Dawn, dusk, and nighttime construction and installation lighting on WTGs and OSSs.
- Beach, other sensitive land-based, and boat and cruise ship views of WTGs and OSSs under construction and installation.

Foreground influence assessments, involving the presence of intervening or framing elements and their influence on effects of project characteristics, are based on each KOP's locale photography and visual simulations and summarized in Table H-34.

Table H-34. Foreground view framing and intervening elements between the KOPs and the lease areas

Foreground Element(s) Influence[1]	Offshore Key Observation Points
Open Ocean **Negligible Influence**	KOP-A Recreational Fishing, Pleasure, and Tour Boat Area KOP-B Commercial and Cruise Ship Shipping Lanes
Beach and Ocean **Minor Influence**	KOP-28 Jones Beach State Park KOP-31 Westhampton Beach KOP-36 Asbury Convention Hall Balcony KOP-11 US Life Saving Station #14 KOP-12 Seaside Beach Park KOP-17 Asbury Park Beach KOP-37 Point O' Woods
Dunes, Beach, and Ocean **Minor Influence**	KOP-3 Stafford Hall Boardwalk KOP-4 Stafford Hall Beach Entrance KOP-10 Barnegat Lighthouse KOP-18 Allenhurst KOP-30 Shinnecock Inlet KOP-14 Bayhead KOP-15 Point Pleasant KOP-16 Ocean Grove
Structures, Dunes, and Beach **Moderate Influence**	KOP-8A Beach Haven (daytime) KOP-8B Beach Haven (night) KOP-6 Atlantic City Boardwalk – Ocean Casino KOP-7 Ocean Casino – Top KOP-9 Barnegat Jetty KOP-27 Magnolia Beach KOP-33 Fire Island Lighthouse – Base

Foreground Element(s) Influence[1]	Offshore Key Observation Points
	KOP-38 Robert Moses Field 5 KOP-40 Robert Moses Field – Nighttime
Bay, Vegetation, Roadway, and Structures **Minor Influence**	KOP-32 Fire Island Lighthouse – Top
Landscape Structures, Vegetation, and Topography **Minor to Moderate Influence**	KOP-13 Mantoloking KOP-35 Navesink Twin Lights – Top
Bay, Landscape Structures, and Topography **Dominant/Major Influence**	KOP-29 Rudolph Oyster House (Long Island Maritime Museum)
Bay, Structures, and Roadways **Dominant/Major Influence**	KOP-39 Empire State Building
Vegetation, Roadway, and Topography **Dominant/Major Influence**	KOP-19 Navesink Twin Lights
Structures, Landscape Structures, Vegetation, and Topography **Minor to Moderate Influence**	KOP-26 Fort Tilden/Jacob Riis (night)
Structures, Dunes, Beach Structures, and Ocean **Dominant/Major Influence**	KOP-2 Lucy the Margate Elephant KOP-5 Jim Whelan KOP-35 Navesink Twin Lights Lighthouse – Top

[1] Based on conditions portrayed by representative photography contained in Argonne (2024). Nearby view receptor locations may vary from screened to open views of the lease area.

Visual contrast determinations on viewer experience are based on visual simulations for 17 representative KOPs (Argonne 2024). Potential viewpoints' evaluations range from faint to dominant. Visual contrast determinations involve comparisons of characteristics of the KOPs before and after implementation of the NY Bight projects. The range of potential contrasts includes strong, moderate, weak, and none. The strongest daytime contrasts would result from tranquil and flat seas combined with sunlit WTG towers, nacelles, flickering rotors, and the yellow tower 50-foot (15.2-meter) base color against a dark background sky and an undifferentiated foreground. The weakest daytime contrasts would result from turbulent seas combined with overcast daylight conditions on WTG towers, nacelles, and rotors against an overcast background sky and a foreground modulated by varied landscape elements. The strongest nighttime contrasts would result from dark skies (absent moonlight) combined with aviation lights, lighting on the OSS, mid-tower lights, and project lighting reflections on low clouds and active (non-reflective) surf, and the dark-sky light dome. The weakest nighttime contrasts would result from moonlit, cloudless skies; tranquil (reflective) seas; and aircraft detection lighting system (ADLS) activation (Sub-alternative C1 [Preferred Alternative]).

There would be daily variation in WTG color contrast as sun angles change from backlit to front-lit (sunrise to sunset), and the backdrop would vary under different lighting and atmospheric conditions. Two sets of photo simulations were produced for selected KOPs. One set approximates the predictable visibility based on the atmospheric visual clarity at the time the photograph was taken. The other set approximates the maximum visibility potential with no visual interference from atmospheric conditions.

Table H-35 identifies which KOPs are simulated and additional KOPs that use this simulation as a reference.

Visual contrast, scale of change, and prominence determinations for KOPs with simulations are listed in Table H-36 through Table H-41 for each lease area and the 1,312-foot (400-meter) and 853-foot (260-meter) WTGs, followed by Table H-42 and Table H-43 for the six projects and 1,312-foot (400-meter) and 853-foot (260-meter) WTGs, respectively.

Photo-simulations are instrumental when assessing visual impacts from KOPs. Table H-35 lists the KOPs with photo-simulations, as well as the KOPs without simulations that are similar in distance to the lease area WTGs as the KOPs with simulations and would represent similar level of visual impact. This table also lists KOPs initially identified for impact evaluation, but were found to be outside of the view of WTGs within any of the six NY Bight lease areas.

Table H-35. KOPs with simulations, KOPs represented by KOPs with simulations, and KOPs outside of view of the lease areas

KOPs with Simulations		KOPs Represented by the KOPs with Simulations	
KOP #[1]	KOP Name	KOP #	KOP Name
KOP-02	Lucy the Margate Elephant	n/a	n/a
KOP-04	John Stafford Beach Entrance	KOP-03	John Stafford Hall – Boardwalk
		KOP-06	Atlantic City Boardwalk Ocean Casino Boardwalk View
KOP-05	Jim Whelan Hall – Balcony	KOP-07	Atlantic City Boardwalk Top of Ocean Casino
KOP-08	Beach Haven (Day)	n/a	n/a
KOP-08	Beach Haven (Night)	n/a	n/a
KOP-10	Barnegat Lighthouse	n/a	n/a
KOP-13	Mantoloking	KOP-14	Bayhead
		KOP-15	Point Pleasant
KOP-18	Allenhurst Residential Historic District	KOP 16	Ocean Grove
		KOP 17	Asbury Park Beach
		KOP 19	Navesink Twin Lights (ground level)
KOP-26	Fort Tilden (Night)	n/a	n/a
KOP-28	Jones Beach	n/a	n/a
KOP-30	Shinnecock Inlet	n/a	n/a
KOP-31	Westhampton Beach	KOP-27	Magnolia Beach
KOP-32	Fire Island Lighthouse Upper Deck	n/a	n/a
KOP-35	Twin Lights Lighthouse	n/a	n/a
KOP-36	Asbury Park Hall – Top	n/a	n/a
KOP-37	Point O' Woods	KOP- 33	Fire Island Lighthouse (Base)
		KOP-38	Robert Moses Field #5 (Day)
KOP-39	Empire State Building	n/a	n/a
KOP-40	Robert Moses Field 5 (Night)	KOP-33	Fire Island Lighthouse (Base)[2]
		KOP-37	Point O'Woods[2]

KOPs with Simulations		KOPs Represented by the KOPs with Simulations	
KOP #[1]	KOP Name	KOP #	KOP Name
KOPs without Simulation Representation (analysis based solely on GIS)			
KOP-09	Barnegat Jetty		
KOP-11	US Life Saving Station #14		
KOP-12	Seaside Park Beach		

[1] Eight KOPs were identified but following the analysis appeared outside of the affected viewshed and have been removed from the impact analysis. These are: KOP-01 Ocean City Music Hall, KOP-20 Sandy Hook Beach, KOP-21 Great Kills, KOP-22 Roosevelt Pier, KOP-23 Statue of Liberty – Upper Deck, KOP-24 Statue of Liberty – Base, KOP-25 Coney Island Boardwalk, and KOP-34 Sandy Hook Observatory.
[2] KOP 40 provides a representative example of nighttime effects for KOP-33 and KOP-37.

The following tables list the analytical results for the two different sets of simulations when the results are different at the respective KOPs. KOPs noted with results based on maximum visibility conditions are labeled with **MAXIMUM VISIBILITY** in the tables, and results on the predicted visibility based on the visual clarity at the time of the photo are labeled with **PREDICTED VISIBILITY**.

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Table H-36. 1,312-foot and 853-foot WTG NY Bight projects magnitude and impacts for OSC-A 0537

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0537	New York Bight Visible FOV Degrees (% of 124°)	OCS-A 0537 Contrast, Scale of Change, and Prominence: Form	Line	Color	Texture	Scale	Prominence[2]	OSC-A 0537 Impact Level: 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	97.4 (156.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-04 John Stafford Hall-Beach Entrance	94.6 (152.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall-Balcony	92.9 (149.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Day	77.1 (124.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Night	77.1 (124.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-10 Barnegat Lighthouse (Elevated 170 feet)	66.4 (106.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-13 Mantoloking	61.5 (99.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-18 Allenhurst Historic District	61.4 (98.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-26 Fort Tilden (Night)	66.6 (107.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-28 Jones Beach	54.4 (87.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	55.2 (88.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-31-Daytime Westhampton Beach	49.4 (29.4) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-32 Fire Island Lighthouse-Upper Deck (Elevated 167 feet)	45.7 (73.5) R, AL, N R	16.5° (13%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Minor -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-32 Fire Island Lighthouse-Upper Deck (Elevated 167 feet)	45.7 (73.5) R, AL, N R	16.5° (13%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-35 Navesink Twin Lights Lighthouse (Elevated 255 feet)	65.0 (104.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-36 Asbury Park Hall-Balcony (Elevated 46.14 feet)	61.3 (98.7) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-37 Point O' Woods	44.8 (72.1) R	17° (14%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Minor -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-37 Point O' Woods	44.8 (72.1) R	17° (14%)	Weak	Weak	Weak	Weak	Small	0	Negligible	Negligible	Same as Alternative B
KOP-39 Empire State Building Observation Deck (Elevated 1,263.1 feet)	78.2 (125.8) R	9.1° (7%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-40 Robert Moses Field-Nighttime	45.9 (73.9) R	16.4° (13%)	Weak	Weak	Negligible	Negligible	Small	0	Negligible	Negligible	Negligible (ADLS)
KOP-A	20–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B
KOP-B	20–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.
[2] WTGs and OSS visibility: 0-Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-37. 1,312-foot and 853-foot WTG NY Bight projects magnitude and impacts for OSC-A 0538

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0538	Visible FOV Degrees (% of 124°)	OCS-A 0538 Contrast, Scale of Change, and Prominence: Form	Line	Color	Texture	Scale	Prominence[2]	OCS-A 0538 Impact Level: 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Margate Elephant	69.5 (111.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-04 John Stafford Beach Entrance	66.7 (107.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall – Balcony	65.0 (104.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Day	50.5 (81.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Night	50.5 (81.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	42.7 (68.7) R, AL, N, H R	15.4° (12%)	Moderate Minor	Minor Minor	Moderate Minor	Minor Minor	Small Small	2 1	Minor -------	------- Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	42.7 (68.7) R, AL, N, H R	15.4° (12%)	Minor None	Minor None	Minor None	Minor None	Small Small	1 0	Negligible -------	------- Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-13 Mantoloking	44.1 (70.9) R	11.2° (9%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Minor -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-13 Mantoloking	44.1 (70.9) R	11.2° (9%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-18 Allenhurst Historic District	48.1 (77.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-26 Fort Tilden (Night)	60.6 (97.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-28 Jones Beach	55.0 (87.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	79.9 (128.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-31 Westhampton Beach	69.8 (112.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-32 Fire Island Lighthouse Deck (Elevated 167 feet)	55.6 (89.5) R	13.5° (11%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Minor -------	------- Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	55.0 (88.6) R	9° (7%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Negligible -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	55.0 (88.6) R	9° (7%)	None	None	None	None	None	0 0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-36 Asbury Park Hall (Elevated 46.14 feet)	47.5 (76.50) R	10.2° (8%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Negligible -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-36 Asbury Park Hall (Elevated 46.14 feet)	47.5 (76.50) R	10.2° (8%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-37 Point O' Woods	57.1 (91.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	73.8 (118.9) R, AL, N, H R	7.8° (6%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-40 Robert Moses Field 5 – Night	55.5 (89.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Negligible (ADLS)
KOP-A	11–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0538	Visible FOV Degrees (% of 124°)	OCS-A 0538 Contrast, Scale of Change, and Prominence Form	Line	Color	Texture	Scale	Prominence[2]	OCS-A 0538 Impact Level 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-B	11–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.
[2] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 –Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-38. 1,312-foot and 853-foot WTG NY Bight projects magnitude and impacts for OSC-A 0539

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0539	Visible FOV Degrees (% of 124°)	OCS -A 0539 Contrast, Scale of Change, and Prominence Form	Line	Color	Texture	Scale	Prominence[2]	Impact Level 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Margate Elephant	59.4 (95.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-04 John Stafford Beach Entrance	53.2 (85.7) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall – Balcony	51.6 (83.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Day	40.4 (64.9) R	18.1° (17%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Night	40.4 (64.9) R	18.1° (17%)	None	None	None	None	None	2	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	37.7 (60.7) R, AL, N, H, M R, AL, N, H	20.6° (17%)	Moderate Weak	Moderate Weak	Strong Moderate	Moderate Weak	Medium Small	4 2	Moderate -------	------- Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	37.7 (60.7) R, AL, N, H, M	20.6° (17%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-13 Mantoloking	41.7 (72.4) R	19.7° (16%)	Weak None	Weak None	Weak None	Weak None	Small None	1	Minor -------	------- Negligible	Same as Alternative B
KOP-18 Allenhurst Historic District	53.2 (85.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-26 Fort Tilden (Night)	69.1 (111.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-28 Jones Beach	64.7 (104.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	91.7 (147.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-31 Westhampton Beach	82.0 (131.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-32 Fire Island Lighthouse Deck (Elevated 167 feet)	67.0 (107.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	62.2 (100.1) R	16.8° (14%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-36 Asbury Park Hall (Elevated 46.14 feet)	52.1 (83.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-37 Point O' Woods	68.7 (110.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	82.9 (133.4) R	13.2° (11%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0539	Visible FOV Degrees (% of 124°)	OCS -A 0539 Contrast, Scale of Change, and Prominence Form	Line	Color	Texture	Scale	Prominence[2]	Impact Level 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-40 Robert Moses Field 5 – Night	66.7 (107.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Negligible (ADLS)
KOP-A	14–47.4 (0–76.3) R, AL, N, H, M, O, Y R, AL, N, H, M, O, Y	0–360° (300%)	Strong Strong	Strong Strong	Strong Strong	Strong Strong	Large Large	6 6	Major -------	------- Major	Same as Alternative B
KOP-B	14–47.4 (0–76.3) R, AL, N, H, M, O, Y R, AL, N, H, M, O, Y	0–360° (300%)	Strong Strong	Strong Strong	Strong Strong	Strong Strong	Large Large	6 6	Major -------	------- Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.
[2] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-39. 1,312-foot and 853-foot WTG NY Bight projects magnitude and impacts for OSC-A 0541

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0541	Visible FOV Degrees (% of 124°)	OCS -A 0541 Contrast, Scale of Change, and Prominence Form	Line	Color	Texture	Scale	Prominence[2]	OCS-A 0541 Impact Level 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
MAXIMUM VISIBILITY KOP-02 Lucy the Margate Elephant	46.4 (74.7) R	23.1° (19%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Negligible -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-02 Lucy the Margate Elephant	46.4 (74.7) R	23.1° (19%)	None	None	None	None	None	0	Negligible -	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-04 John Stafford Beach Entrance	43.7 (70.5) R	24.4° (20%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Negligible -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-04 John Stafford Beach Entrance	43.7 (70.5) R	24.4° (20%)	None	None	None	None	None	0	Negligible -	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall – Balcony	42.3 (68.0) R	25.2° (20%)	None	None	None	None	None	0 0	Negligible -------	------- Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-08 Beach Haven – Day	32.9 (53.0) R, AL, N, H	28.1° (23%)	Moderate Weak	Moderate Weak	Moderate Weak	Moderate Weak	Small Small	3 1	Minor -------	------- Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-08 Beach Haven – Day	32.9 (53.0) R, AL, N, H	28.1° (23%)	None	None	None	None	None	0	Negligible -	Negligible	Same as Alternative B
KOP-08 Beach Haven – Night	32.9 (53.0) R, AL, N, H	28.1° (23%)	Minor None	Moderate None	Moderate None	Weak None	Small None	3 0	Minor -------	------- Negligible	Negligible (ADLS)
MAXIMUM VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	32.2 (52.0) R, AL, N, H, M, O R, AL, N, H, M, O	23.8° (19%)	Moderate Weak	Moderate Weak	Moderate Moderate	Moderate Moderate	Small Small	3 2	Minor -------	------- Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	32.2 (52.0) R, AL, N, H, M, O R, AL, N, H, M, O	23.8° (19%)	Weak None	Weak None	Weak None	Weak None	Small None	3 0	Minor -----	-------- Negligible	Same as Alternative B
KOP-13 Mantoloking	44.6 (71.7) R	16.4° (13%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Negligible -------	------- Negligible	Same as Alternative B
KOP-18 Allenhurst Historic District	55.7 (89.7) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-26 Fort Tilden (Night)	76.0 (122.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-28 Jones Beach	75.5 (121.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	110.3 (177.4) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0541	Visible FOV Degrees (% of 124°)	OCS -A 0541 Contrast, Scale of Change, and Prominence: Form	Line	Color	Texture	Scale	Prominence[2]	OCS-A 0541 Impact Level: 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-31 Westhampton Beach	99.6 (160.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-32 Fire Island Lighthouse Deck (Elevated 167 feet)	81.9 (131.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	66.0 (106.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-36 Asbury Park Hall (Elevated 46.14 feet)	54.4 (87.5) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-37 Point O' Woods	84.4 (135.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	89.0 (143.2) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-40 Robert Moses Field 5 – Night	81.5 (131.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-A	5–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B
KOP-B	5–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.
[2] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-40. 1,312-foot and 853-foot WTG NY Bight projects magnitude and impacts for OSC-A 0542

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1]	Visible FOV Degrees (% of 124°)	OCS -A 0542 Contrast, Scale of Change, and Prominence						Impact Level		
	OCS-A 0542		Form	Line	Color	Texture	Scale	Prominence[2]	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Margate Elephant	48.9 (78.7) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-04 John Stafford Beach Entrance	46.8 (75.4) R	18.2° (15%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall - Balcony	45.5 (73.3) R	18.9° (15%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-08 Beach Haven – Day	42.3 (68.2) R	24.3° (20%)	Moderate Weak	Moderate Weak	Weak Weak	Weak Weak	Small Small	3 1	Minor -------	------- Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-08 Beach Haven – Day	42.3 (68.2) R	24.3° (20%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Night	42.3 (68.2) R	24.3° (20%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	42.5 (68.4) R, AL, N, H R, AL, N, H	18.2° (15%)	Moderate Weak	Moderate Weak	Moderate Moderate	Moderate Moderate	Small Small	3 2	Minor -------	------- Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-10 Barnegat Lighthouse (Elevated 170 feet)	42.5 (68.4) R, AL, N, H R, AL, N, H	18.2° (15%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-13 Mantoloking	53.2 (85.7) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-18 Allenhurst Historic District	63.3 (101.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-26 Fort Tilden (Night)	82.0 (131.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-28 Jones Beach	80.9 (130.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	109.7 (176.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-31 Westhampton Beach	99.6 (160.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-32 Fire Island Lighthouse Deck (Elevated 167 feet)	83.9 (135.0) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	73.2 (117.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-36 Asbury Park Hall (Elevated 46.14 feet)	62.0 (99.8) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-37 Point O' Woods	85.8 (138.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	95.3 (153.4) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-40 Robert Moses Field 5 – Night	83.5 (134.3) None	None	None	None	None	None	None	0	Negligible	Negligible	Negligible (ADLS)
KOP-A	14–47.4 (0 – 76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1]	Visible FOV Degrees (% of 124°)	OCS -A 0542 Contrast, Scale of Change, and Prominence						Impact Level		
	OCS-A 0542		Form	Line	Color	Texture	Scale	Prominence[2]	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-B	14–47.4 (0 – 76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.

[2] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-41. 1,312-foot and 853-foot WTG NY Bight projects magnitude and impacts for OSC-A 0544

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0544	Visible FOV Degrees (% of 124°)	OCS-A 0544 Contrast, Scale of Change, and Prominence: Form	Line	Color	Texture	Scale	Prominence[2]	OCS-A 0544 Impact Level: 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Margate Elephant	92.7 (149.1) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-04 John Stafford Beach Entrance	89.7 (144.6) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall – Balcony	88.2 (141.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Day	70.8 (113.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-08 Beach Haven – Night	70.8 (113.9) None	None	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-10 Barnegat Lighthouse (Elevated 170 feet)	57.0 (91.8) R	5.8° (5%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-13 Mantoloking	47.3 (61.4) R	8.9° (7%)	None None	None None	Weak None	None None	Small None	1 0	Negligible ------	------ Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-13 Mantoloking	47.3 (61.4) R	8.9° (7%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-18 Allenhurst Historic District	42.5 (68.4) R	12.2° (10%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Minor -------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-18 Allenhurst Historic District	42.5 (68.4) R	12.2° (10%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-26 Fort Tilden (Night)	43.9 (70.6) R	16.1° (13%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-28 Jones Beach	31.9 (51.4) R, AL, N, H R	23.1° (19%)	Weak Weak	Weak Weak	Medium Weak	Weak Weak	Small Small	3 1	Minor ------	------ Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-28 Jones Beach	31.9 (51.4) R, AL, N, H R	23.1° (19%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-30 Shinnecock Inlet	44.5 (71.9) R	7.4° (6%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-30 Shinnecock Inlet	44.5 (71.9) R	7.4° (6%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-31 Westhampton Beach	33.9 (54.5) R, AL, N, H R	11.5° (9%)	Weak Weak	Weak Weak	Weak Weak	Weak Weak	Small Small	2 1	Minor ------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-31 Westhampton Beach	33.9 (54.5) R, AL, N, H R	11.5° (9%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-32 Fire Island Lighthouse Deck (Elevated 167 feet)	24.2 (38.9) R, AL, N, H, M, Y R, AL, N, H, M, Y	27.9° (22%)	Moderate Moderate	Moderate Moderate	Strong Strong	Moderate Moderate	Medium Medium	4 4	Moderate -------	------ Moderate	Same as Alternative B
PREDICTED VISIBILITY KOP-32 Fire Island Lighthouse Deck (Elevated 167 feet)	24.2 (38.9) R, AL, N, H, M, Y R, AL, N, H, M,	27.9° (22%)	Weak Weak	Weak Weak	Weak Weak	Moderate Weak	Medium Small	3 2	Minor -------	-------- Minor	Same as Alternative B
MAXIMUM VISIBILITY KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	44.0 (70.9) R, AL, N, H, M R, AL, N, H, M	13.9° (11%)	Weak Weak	Weak Weak	Weak Weak	Weak Weak	Small Small	1 1	Minor ------	------ Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-35 Twin Lights Lighthouse (Elevated 255 feet)	44.0 (70.9) R, AL, N, H, M R, AL, N, H, M	13.9° (11%)	None None	None None	None None	None None	None None	0 0	Negligible -------	------- Negligible	Same as Alternative B

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0544	Visible FOV Degrees (% of 124°)	OCS -A 0544 Contrast, Scale of Change, and Prominence Form	Line	Color	Texture	Scale	Prominence[2]	OCS-A 0544 Impact Level 1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
MAXIMUM VISIBILITY KOP-36 Asbury Park Hall (Elevated 46.14 feet)	42.9 (69.0) R	12.0° (10%)	Weak None	Weak None	Weak None	Weak None	Small None	1 0	Negligible --------	------- Negligible	Same as Alternative B
PREDICTED VISIBILITY KOP-36 Asbury Park Hall (Elevated 46.14 feet)	42.9 (69.0) R	12.0° (10%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
MAXIMUM VISIBILITY KOP-37 Point O' Woods (Alternative B Impact Level based on KOP-40 nighttime impact)	24.1 (38.7) R, AL, N, H, M, O R, AL, N, H, M, O	25.7° (21%)	Moderate Weak	Strong Moderate	Strong Moderate	Moderate Weak	Medium Medium	4 3	Moderate ------	------- Minor	Negligible with ADLS
PREDICTED VISIBILITY KOP-37 Point O' Woods	24.1 (38.7) R, AL, N, H, M, O R, AL, N, H, M, O	25.7° (21%)	Moderate Weak	Moderate Weak	Moderate Weak	Moderate Weak	Medium Small	3 2	Moderate -------	-------- Minor	Same as Alternative B
MAXIMUM VISIBILITY KOP-39 Empire State Building (Elevated 1,263.1 feet)	55.35 (89.0) R, AL, N, H, M, O, Y R, AL, N, H, M, O	13.4° (11%)	Weak Weak	Weak Weak	Moderate Weak	Moderate Weak	Small Small	2 1	Minor ------	------ Minor	Same as Alternative B
PREDICTED VISIBILITY KOP-39 Empire State Building (Elevated 1,263.1 feet)	55.35 (89.0) R, AL, N, H, M, O, Y R, AL, N, H, M, O	13.4° (11%)	None	None	None	None	None	0	Negligible	Negligible	Same as Alternative B
KOP-40 Robert Moses Field 5 – Night	24.2 (38.9) R, AL, N, H, M, O	28.3° (23%)	Weak Weak	Moderate Moderate	Moderate Moderate	Weak Weak	Medium Medium	4 4	Moderate -----	----- Moderate	Negligible with ADLS
KOP-A	0–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B
KOP-B	0–47.4 (0–76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.
[2] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-42. 1,312-foot NY Bight projects magnitude and impacts (six projects)

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1] OCS-A 0537	OCS-A 0538	OCS-A 0539	OCS-A 0541	OCS-A 0542	OCS-A 0544	New York Bight Visible FOV Degrees (% of 124°)	New York Bight Contrast, Scale of Change, and Prominence Form	Line	Color	Texture	Scale	Prominence[2]	Impact Level	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	97.4 (156.8) None	69.5 (111.8) None	59.4 (95.6) None	46.4 (74.7) R	48.9 (78.7) None	92.7 (149.1) None	24° (19%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	94.6 (152.3) None	66.7 (107.3) None	53.2 (85.7) None	43.7 (70.5) R	46.8 (75.4) R	89.7 (144.6) None	24.4° (20%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	92.9 (149.8) None	65.0 (104.6) None	51.6 (83.1) None	42.3 (68.0) R	45.5 (73.3) R	88.2 (141.9) None	25.2° (20%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-08A Beach Haven – Daytime	77.1 (124.1) None	50.5 (81.2) None	40.4 (64.9) R	32.9 (53.0) R, AL, N, H	42.3 (68.2) R	70.8 (113.9) None	42.7° (34%)	Moderate	Moderate	Moderate	Weak	Small	3	Minor	Same as Alternative B
KOP-08B Beach Haven –Nighttime	77.1 (124.1) None	50.5 (81.2) None	40.4 (64.9) R	32.9 (53.0) R, AL, N, H	42.3 (68.2) R	70.8 (113.9) None	42.7° (34%)	Moderate	Moderate	Moderate	Moderate	Small	3	Minor	Negligible with ADLS
KOP-10 Barnegat Lighthouse (Elevated 170 feet)	66.4 (106.9) None	42.7 (68.7) R, AL, N, H,	37.7 (60.7) R, AL, N, H, M,	32.2 (52.0) R, AL, N, H, M, O	42.5 (68.4) R, AL, N, H,	57.0 (91.8) R	91° (73%)	Moderate	Moderate	Strong	Moderate	Medium	4	Moderate	Same as Alternative B

KOP	Distance in Miles (Kilometers) and Noticeable Elements[1]						New York Bight Visible FOV Degrees (% of 124°)	New York Bight Contrast, Scale of Change, and Prominence							
	OCS-A 0537	OCS-A 0538	OCS-A 0539	OCS-A 0541	OCS-A 0542	OCS-A 0544		Form	Line	Color	Texture	Scale	Prominence[2]	Impact Level	Sub-alternatives C1 and C2
KOP-13 Mantoloking	61.5 (99.5) None	44.1 (70.9) R	41.7 (72.4) R	44.6 (71.7) R	53.2 (85.7) None	47.3 (61.4) R	80.5° (65%)	Weak	Weak	Weak	Weak	Small	2	Minor	Same as Alternative B
KOP-18 Allenhurst Residential HD	61.4 (98.8) None	48.1 (77.5) None	53.2 (85.6) None	55.7 (89.7) None	63.3 (101.8) None	42.5 (68.4) R	48.4° (39%)	Weak	Weak	Weak	Weak	Small	2	Minor	Same as Alternative B
KOP-26 Fort Tilden - nighttime	66.6 (107.2) None	60.6 (97.5) None	69.1 (111.2) None	76.0 (122.2) None	82.0 (131.9) None	43.9 (70.6) R	15° (12%)	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-28 Jones Beach	54.4 (87.5) None	55.0 (87.9) None	64.7 (104.1) None	75.5 (121.9) None	80.9 (130.1) None	31.9 (51.4) R, AL, N, H	23.1° (19%)	Weak	Weak	Moderate	Moderate	Small	3	Minor	Same as Alternative B
KOP-30 Shinnecock Inlet	55.2 (88.8) None	79.9 (128.5) None	91.7 (147.5) None	110.3 (177.4) None	109.7 (176.6) None	44.5 (71.9) R	5.7° (5%)	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-31 Westhampton Beach – Daytime	49.4 (29.4) None	69.8 (112.3) None	82.0 (131.9) None	99.6 (160.3) None	99.6 (160.3) None	33.9 (54.5) R, AL, N, H	11.5° (9%)	Weak	Weak	Weak	Weak	Small	2	Minor	Same as Alternative B
KOP-32 Fire Island LH Upper Deck (Elevated 167 feet)	45.7 (73.5) R, AL, N	55.6 (89.5) R	67.0 107.9) None	81.9 (131.9) None	83.9 (135.0) None	24.2 (38.9) R, AL, N, H, M, Y	41.1° (33%)	Moderate	Moderate	Strong	Moderate	Medium	4	Moderate	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	65.0 (104.6) None	55.0 (88.6) R	62.2 (100.1) None	66.0 (106.2) None	73.2 (117.8) None	44.0 (70.9) R, AL, N, H, M	57.8° (47%)	Weak	Weak	Weak	Weak	Small	1	Minor	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	61.3 (98.7) None	47.5 (76.50) R	52.1 (83.9) R	54.4 (87.5) None	62.0 (99.8) None	42.9 (69.0) R	61.9° (50%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-37 Point O' Woods (Alternative B Impact Level based on KOP-40 nighttime impact)	44.8 (72.1) R	57.1 (91.9) None	68.7 (110.6) None	84.4 (135.9) None	85.8 (138.1) None	24.1 (38.7) R, AL, N, H, M, O	38.2° (31%)	Moderate	Strong	Strong	Moderate	Medium	4	Moderate (Moderate Nighttime)	Negligible with ADLS
KOP-39 Empire State Building (Elevated 1,263.1 feet)	78.2 (125.8) R	73.8 (118.9) R, AL, N, H	82.9 (133.4) R	89.0 (143.2) None	95.3 (153.4) None	55.35 (89.0) R, AL, N, H, M, O, Y	42.4° (34%)	Weak	Weak	Weak	Weak	Small	2	Minor	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	45.9 73.9) R	55.5 (89.2) None	66.7 (107.3) None	81.5 (131.1) None	83.5 (134.3) None	24.2 (38.9) R, AL, N, H, M, O	31.5° (25%)	Weak	Strong	Strong	Weak	Medium	4	Moderate	Negligible with ADLS
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–47.4 (76.3) (68.4) R, AL, N, H, M, O, Y	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–47.4 (76.3) (68.4) R, AL, N, H, M, O, Y	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Same as Alternative B
KOP-B Commercial and Cruise Ship Shipping Lanes	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–47.4 (76.3) (68.4) R, AL, N, H, M, O, Y	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–47.4 (76.3) (68.4) R, AL, N, H, M, O, Y	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–47.4 (76.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Same as Alternative B

[1] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.
[2] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise, likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).
LH = Lighthouse; HD = Historic District

Table H-43. 853-foot NY Bight projects magnitude and impacts (six projects)

KOP[1]	Distance in Miles (Kilometers) and Noticeable Elements[2]						New York Bight Visible FOV Degrees (% of 124°)	New York Bight Contrast, Scale of Change, and Prominence							
	OCS-A 0537	OCS-A 0538	OCS-A 0539	OCS-A 0541	OCS-A 0542	OCS-A 0544		Form	Line	Color	Texture	Scale	Prominence[3]	Impact Level	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	97.4 (156.8) None	69.5 (111.8) None	59.4 (95.6) None	46.4 (74.7) None	48.9 (78.7) None	92.7 (149.1) None	None	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-04 John Stafford Hall-Beach Entrance	94.6 (152.3) None	66.7 (107.3) None	53.2 (85.7) None	43.7 (70.5) None	46.8 (75.4) None	89.7 (144.6) None	None	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall-Balcony	92.9 (149.8) None	65.0 (104.6) None	51.6 (83.1) None	42.3 (68.0) None	45.5 (73.3) None	88.2 (141.9) None	21.4° (17%)	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-08A Beach Haven – Daytime	77.1 (124.1) None	50.5 (81.2) None	40.4 (64.9) None	32.9 (53.0) R	42.3 (68.2) None	70.8 (113.9) None	27.2° (22%)	Weak	Weak	Weak	Weak	Small	2	Minor	Same as Alternative B
KOP-08B Beach Haven – Nighttime	77.1 (124.1) None	50.5 (81.2) None	40.4 (64.9) None	32.9 (53.0) R	42.3 (68.2) None	70.8 (113.9) None	27.2° (22%)	None	None	None	None	None	0	Negligible	Negligible (ADLS)
KOP-10 Barnegat LH (Elevated 170 feet)	66.4 (106.9) None	42.7 (68.7) R	37.7 (60.7) R, AL, N, H, M	32.2 (52.0) R, AL, N, H, M, O,	42.5 (68.4) R, AL, N, H	57.0 (91.8) R	63.0° (51%)	Weak	Weak	Moderate	Weak	Small	2	Minor	Same as Alternative B
KOP-13 Mantoloking	61.5 (99.5) None	44.1 (70.9) None	41.7 (72.4) None	44.6 (71.7) None	53.2 (85.7) None	47.3 (61.4) None	None	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	61.4 (98.8) None	48.1 (77.5) None	53.2 (85.6) None	55.7 (89.7) None	63.3 (101.8) None	42.5 (68.4) R	None	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-26 Fort Tilden	66.6 (107.2) None	60.6 (97.5) None	69.1 (111.2) None	76.0 (122.2) None	82.0 (131.9) None	43.9 (70.6) None	None	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-28 Jones Beach	54.4 (87.5) None	55.0 (87.9) None	64.7 (104.1) None	75.5 (121.9) None	80.9 (130.1) None	31.9 (51.4) R	23.1° (19%)	Weak	Weak	Weak	Weak	Small	2	Minor	Same as Alternative B
KOP-30 Shinnecock Inlet	55.2 (88.8) None	79.9 (128.5) None	91.7 (147.5) None	110.3 (177.4) None	109.7 (176.6) None	44.5 (71.9) None	None	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-31- Westhampton Beach Daytime	49.4 (29.4) None	69.8 (112.3) None	82.0 (131.9) None	99.6 (160.3) None	99.6 (160.3) None	33.9 (54.5) R	8.9° (7%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-32 Fire Island LH-Upper Deck (Elevated 167 feet)	45.8 (73.7) R	55.8 (89.7) R	67.0 107.9) None	81.9 (131.9) None	83.9 (135.0) None	24.2 (38.9) R, AL, N, H, M	34.7° (28%)	Moderate	Moderate	Moderate	Moderate	Medium	5	Moderate	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	65.0 (104.6) None	55.0 (88.6) R	62.2 (100.1) None	66.0 (106.2) None	73.2 (117.8) None	44.0 (70.9) R, AL, N, H, M	41.1° (33%)	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-36 Asbury Park Hall-Top (Elevated 46 feet)	61.3 (98.7) None	47.5 (76.50) None	52.1 (83.9) None	54.4 (87.5) None	62.0 (99.8) None	42.9 (69.0) None	6.1° (5%)	None	None	None	None	None	0	Negligible	Same as Alternative B
KOP-37 Point O' Woods (Alternative B Impact Level based on KOP-40 nighttime impact)	44.8 (72.1) None	57.1 (91.9) None	68.7 (110.6) None	84.4 (135.9) None	85.8 (138.1) None	24.1 (38.7) R, AL, N, H, M, O	25.7° (21%)	Weak	Moderate	Moderate	Weak	Small	3	Minor	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263 feet)	78.2 (125.8) R	73.8 (118.9) R	82.9 (133.4) None	89.0 (143.2) None	95.3 (153.4) None	55.35 (89.0) R, AL, N, H, M, O	33.5° (27%)	Weak	Weak	Weak	Weak	Small	1	Negligible	Same as Alternative B
KOP-40 Robert Moses Field 5 – nighttime	45.9 73.9) None	55.5 (89.2) None	66.7 (107.3) None	81.5 (131.1) None	83.5 (134.3) None	24.2 (38.9) R, AL, N, H, M, O	28.3° (23%)	Weak	Moderate	Moderate	Weak	Medium	4	Moderate	Negligible (ADLS)

KOP[1]	Distance in Miles (Kilometers) and Noticeable Elements[2]						New York Bight Visible FOV Degrees (% of 124°)	New York Bight Contrast, Scale of Change, and Prominence							
	OCS-A 0537	OCS-A 0538	OCS-A 0539	OCS-A 0541	OCS-A 0542	OCS-A 0544		Form	Line	Color	Texture	Scale	Prominence[3]	Impact Level	Sub-alternatives C1 and C2
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Same as Alternative B
KOP-B Commercial and Cruise Ship Shipping Lanes	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–38.7 (62.3) R, AL, N, H, M, O, Y	0–360° (300%)	Strong	Strong	Strong	Strong	Large	6	Major	Same as Alternative B

[1] LH – Lighthouse, HD – Historic District

[2] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, M = mid-tower light, O = OSS, and Y = yellow tower base color.

[3] WTGs and OSS visibility: 0 – Not visible. 1 – Visible only after extended study; otherwise not visible. 2 – Visible when viewing in general direction of the lease areas; otherwise likely to be missed by casual observer. 3 – Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 – Plainly visible; could not be missed by casual observer, but does not strongly attract visual attention or dominate view. 5 – Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 – Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

H.3.2.3 Visual Impact Assessment Summary

The VIA considers the characteristics of the view receptor, characteristics of the view toward the NY Bight project facilities, and the experiential impacts of the NY Bight project. The viewer experiences would be affected by the NY Bight projects' noticeable features; applicable distances and FOV extents; open views versus view framing and intervening foregrounds, and form, line, color, and texture contrasts; scale of change; and prominence in the characteristic seascape and landscape. Higher impact levels would stem from unique, extensive, and long-term appearance of strongly contrasting, large, and prominent vertical structures in the otherwise horizontal seascape environment; where structures are an unexpected element and viewer experience is of formerly open views of high-sensitivity seascape and landscape; and from high sensitivity view receptors. Based on these VIA impact range factors and the geographic analysis area viewer experience analyses, Table H-44 through Table H-50 summarize impacts from the NY Bight projects on the viewer experience (KOP locations) for each lease area and the six NY Bight projects combined. Impacts of the NY Bight projects on viewer experiences range from **negligible** to **major**.

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Table H-44. Summary table for OCS-A 0537 viewer experience

		Sensitivity						Magnitude of Impact									Visibility Threshold Rating				OCS-A 0537 Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
Viewpoint	WTGs (feet)	High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A/B Beach Haven – Daytime and Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-26 Fort Tilden – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31-Westhampton Beach – Daytime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH (Elevated 167 feet)	1,312	X			X				X				X		X				X		Minor		Same as Alternative B
	853	X			X					X			X		X				X			Negligible	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	1,312	X			X					X			X		X				X		Minor		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B

[1] Representative

LH = Lighthouse; HD = Historic District

Table H-45. Summary table for OCS-A 0538 viewer experience

	WTGs (feet)	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				OCS-A 0538 Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
		High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A/B Beach Haven – Daytime and Nighttime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X					X			X		X				X			Minor	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-26 Fort Tilden – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31-Westhampton Beach – Daytime	1,312	X			X										X					X	Negligible		Same as Alternative B
	8WTG53	X			X										X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH (Elevated 167 feet)	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X					X			X		X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	1,312	X			X					X			X		X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B

[1] Representative

LH = Lighthouse; HD = Historic District

Table H-46. Summary table for OCS-A 0539 viewer experience

Character Area	WTGs (feet)	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				OCS-A 0539 Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
		High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A/B Beach Haven – Daytime and Nighttime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X				X			X			X			X			Moderate		Same as Alternative B
	853	X			X					X			X						X			Minor	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-26 Fort Tilden – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31-Westhampton Beach – Daytime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH (Elevated 167 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B

[1] Representative
LH = Lighthouse; HD = Historic District

Table H-47. Summary table for OCS-A 0541 viewer experience

Character Area	WTGs (feet)	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				OCS-A 0541 Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
		High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X					X			X		X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	1,312	X			X					X			X		X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	1,312	X			X					X			X		X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A Beach Haven – Daytime	1,312	X			X				X			X			X			X			Minor		Same as Alternative B
	853	X			X					X			X		X				X			Minor	Same as Alternative B
KOP-08B Beach Haven – Nighttime	1,312	X			X				X				X		X			X			Minor		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X					X			X		X			X			Minor		Same as Alternative B
	853	X			X					X			X		X				X			Minor	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-26 Fort Tilden – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31-Westhampton Beach – Daytime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH (Elevated 167 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B

[1] Representative
LH = Lighthouse; HD = Historic District

Table H-48. Summary table for OCS-A 0542 viewer experience

Character Area	WTGs (feet)	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				OCS-A 0542 Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
		High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A/B Beach Haven – Daytime and Nighttime	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X					X			X		X				X	X	Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-26 Fort Tilden – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31-Westhampton Beach – Daytime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH (Elevated 167 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	1,312	X			X										X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B

[1] Representative
LH = Lighthouse; HD = Historic District

Table H-49. Summary table for OCS-A 0544 viewer experience

Character Area	WTGs (feet)	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				OCS-A 0544 Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
		High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall Beach Entrance	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall Balcony	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A/B Beach Haven – Daytime and Nighttime	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X					X			X		X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X					X			X		X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X					X			X		X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-26 Fort Tilden – Nighttime	1,312	X			X					X			X		X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X				X			X			X				X		Minor		Same as Alternative B
	853	X			X					X			X		X				X			Minor	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31-Westhampton Beach – Daytime	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X					X			X		X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH (Elevated 167 feet)	1,312	X			X				X			X			X			X			Moderate		Same as Alternative B
	853	X			X				X			X			X			X				Moderate	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X					X			X		X					X		Negligible	Same as Alternative B
KOP-36 Ashbury Park Hall – Top (Elevated 46.14 feet)	1,312	X			X					X			X		X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X				X			X			X			X			Moderate		Same as Alternative B
	853	X			X					X			X		X				X			Minor	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X					X			X		X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field – Nighttime	1,312	X			X				X			X			X			X			Moderate		Negligible (ADLS)
	853	X			X				X			X			X			X				Moderate	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B

[1] Representative
LH = Lighthouse; HD = Historic District

Table H-50. Viewer experience summary table for six NY Bight projects

KOP	WTGs (feet)	Sensitivity						Magnitude of Impact									Visibility Threshold Rating				Six Projects Impact Levels		
		Susceptibility			Value			Size and Scale of Change			Geographic Extent			Duration & Reversibility									
		High	Moderate	Low	High	Moderate	Low	Large	Medium	Small	Large	Medium	Small	Good	Fair	Poor	High (5–6)	Moderate (3–4)	Low (1–2)	Unseen	1,312-Foot WTGs	853-Foot WTGs	Sub-alternatives C1 and C2
KOP-02 Lucy the Elephant	1,312	X			X							X			X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-04 John Stafford Hall-Beach Entrance	1,312	X			X					X		X			X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-05 Jim Whelan Hall-Balcony	1,312	X			X										X					X	Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-08A Beach Haven – Daytime	1,312	X			X					X			X		X			X			Minor		Same as Alternative B
	853	X			X					X		X			X				X			Minor	Same as Alternative B
KOP-08B Beach Haven – Nighttime	1,312	X			X					X			X		X			X			Minor		Negligible (ADLS)
	853	X			X					X			X		X					X		Negligible	Negligible (ADLS)
KOP-10 Barnegat LH (Elevated 170 feet)	1,312	X			X				X		X				X			X			Moderate		Same as Alternative B
	853	X			X					X	X				X				X			Minor	Same as Alternative B
KOP-13 Mantoloking	1,312	X			X					X	X				X				X		Minor		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-18 Allenhurst Residential HD	1,312	X			X					X	X				X				X		Minor		Same as Alternative B
	853	X			X					X			X		X				X			Negligible	Same as Alternative B
KOP-26 Fort Tilden - Nighttime	1,312	X			X							X			X					X	Negligible		Negligible (ADLS)
	853	X			X										X					X		Negligible	Negligible (ADLS)
KOP-28 Jones Beach	1,312	X			X					X		X			X			X			Minor		Same as Alternative B
	853	X			X					X		X			X				X			Minor	Same as Alternative B
KOP-30 Shinnecock Inlet	1,312	X			X								X		X				X		Negligible		Same as Alternative B
	853	X			X										X					X		Negligible	Same as Alternative B
KOP-31- Westhampton Beach Daytime	1,312	X			X					X			X		X				X		Minor		Same as Alternative B
	853	X			X								X		X					X		Negligible	Same as Alternative B
KOP-32 Fire Island LH-Upper Deck (Elevated 167 feet)	1,312	X			X				X		X				X			X			Moderate		Same as Alternative B
	853	X			X				X			X			X			X				Moderate	Same as Alternative B
KOP-35 Twin Lights LH (Elevated 255 feet)	1,312	X			X					X	X				X				X		Minor		Same as Alternative B
	853	X			X					X	X				X				X			Negligible	Same as Alternative B
KOP-36 Asbury Park Hall-Top (Elevated 46.14 feet)	1,312	X			X						X				X				X		Negligible		Same as Alternative B
	853	X			X								X		X					X		Negligible	Same as Alternative B
KOP-37 Point O' Woods	1,312	X			X				X		X				X			X			Moderate		Same as Alternative B
	853	X			X					X		X			X				X			Minor	Same as Alternative B
KOP-39 Empire State Building (Elevated 1,263.1 feet)	1,312	X			X					X	X				X				X		Minor		Same as Alternative B
	853	X			X							X			X					X		Negligible	Same as Alternative B
KOP-40 Robert Moses Field - Nighttime	1,312	X			X				X			X			X		X				Moderate		Negligible (ADLS)
	853	X			X				X			X			X			X				Moderate	Negligible (ADLS)
KOP-A Recreational Fishing, Pleasure, and Tour Boat Area [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X			X			X				X		X					Major	Same as Alternative B
KOP-B Commercial and Cruise Shipping Lanes [1]	1,312	X			X			X			X				X		X				Major		Same as Alternative B
	853	X			X						X				X		X					Major	Same as Alternative B

[1] Representative
LH = Lighthouse; HD = Historic District

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H.4 Cumulative Impacts of NY Bight Projects

NEPA requires consideration of other reasonably foreseeable activities in the project's viewshed and the project's additive effects on open ocean character, seascape character, landscape character, and viewer experience. These effects include direct physical effects on the open ocean, seascape, and landscape or changes to the distinct character of the open ocean, seascape, and landscape.

Effects on open ocean character, seascape character, and landscape character can occur in the following conditions (SLVIA Chapter 8; BOEM 2021).

- Multi-project WTGs and OSSs visible within or from the open ocean character unit as overlapping or adjacent features and elements.
- Multi-project WTGs and OSSs visible from seascape character units as overlapping or adjacent features and elements.
- Multi-project WTGs and OSSs visible from landscape character units as overlapping or adjacent features and elements.

Effects on viewer experience can occur in the following conditions (SLVIA Chapter 8; BOEM 2021).

- Multi-project WTGs and OSSs visible as overlapping features and elements.
- Multi-project WTGs and OSSs visible as adjacent features and elements.
- Multi-project WTGs and OSSs visible as viewers move through the open ocean, seascape, and landscape.

Simulations of the additive effects of the project in the context of other offshore wind projects are available on the BOEM website (https://www.boem.gov/renewable-energy/state-activities/new-york-bight). The KOP-based visual simulations portray 1,312-foot (400-meter) and 853-foot (260-meter) WTG predicted and maximum visibility for three construction and installation scenarios:

- The project construction (six NY Bight lease areas) without other foreseeable planned activities.
- The project construction with other foreseeable planned activities. 2024–2030 Project Construction includes Ocean Wind 1 OCS-A-0498, Empire Wind OCS-A 0512, Empire Wind II OCS-A 0512, Atlantic Shores Offshore Wind South OCS-A 0499, Atlantic Shores Offshore Wind North OCS-A 0539, and Ocean Wind 2 OCS-A532.[1]
- Other foreseeable planned activities without the six NY Bight leases.

[1] Refer to footnotes 9 and 10 in PEIS Chapter 1 for additional information on the status of Ocean Wind 1, Empire Wind 1, and Empire Wind 2.

The number of offshore wind structures illustrated in the simulations differs from the number of structures assumed in Appendix D, *Planned Activities Scenario*. This is due to the timing of when Appendix D and simulations documents were developed, and the assumptions used in developing the layouts for the simulations. The number of offshore structures identified in both documents are estimates of reasonably foreseeable offshore wind development and are subject to change as lessees submit COPs and refine their development plans. BOEM believes the simulations presented on their website provide a reasonable approximation of the scale, contrast, and prominence of visual impacts that would occur from development of the NY Bight projects in combination with other ongoing and planned offshore wind projects.

The effects of other lease areas on open ocean character, seascape character, and landscape character are described in Table H-51. Increased impacts on the open ocean character area, seascape character areas, and landscape character areas stem from the effects of additional WTGs in view of the character areas. Effects include additive expansions to the perceived geographic extents of lease areas' FOVs, greater magnitudes of character-changing turbines and substations, and increased daytime and nighttime vessel traffic. Simulations show that lease area proximities to character areas increase and decrease the character-changing interactions of key features and key elements. Those simulations showing beach views toward lease areas with visible WTGs' yellow bases and platforms, mid-tower lights, substations, hubs, nacelles, aviation lights, and rotors change seascape character more than views with more distant and fewer visible WTG elements.

The effects on open ocean character, seascape character, and landscape character of other lease areas in combination with the NY Bight projects are described in Table H-52.

The effects on viewer experience from non-NY Bight projects are described in Table H-53.

The effects on viewer experience of other lease areas in combination with the NY Bight projects are described in Table H-54.

Table H-51. Non-NY Bight projects' open ocean, seascape, and landscape areas cumulative lease area distances, FOVs, noticeable elements, visual contrasts, scale of change, and prominence

Lease Area and Additive Date	Distance in Miles (Kilometers)[1] and Impacts			FOV Degrees (% of 124°)			Noticeable Elements[2] and Impact Level	Visual Contrast, Scale of Change, and Prominence					
	Seascape[4]	Open Ocean	Landscape[4]	Seascape	Open Ocean	Landscape		Form	Line	Color	Texture	Scale	Prominence[3]
Atlantic Shores Offshore Wind South OCS-A 0499 2026	8.7 (14.0) **Major**	0 (0)–42.5 (68.4) **Major**	9.0 (14.5) **Major**	136° (110%)	82° to 360° (66 to 290%)	136° (110%)	R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Atlantic Shores Offshore Wind North OCS-A 0549 2030	9.0 (14.5) **Major**	0 (0)–42.5 (68.4) **Major**	9.2 (14.8) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Empire Wind I and II OCS-A 0512 2030	14.1 (22.7) **Moderate**	0 (0)–40.7 (65.5) **Major**	34.9 (56.1) **Minor**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Ocean Wind 1 OCS-A-0498 2025	15.3 (24.6) **Major**	0 (0)–39.6 (63.7) **Major**	15.5 (24.9) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Ocean Wind 2 OCS-A532 2030	9.2 (14.7) **Major**	0 (0)–39.6 (63.7) **Major**	15.5 (24.9) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6

[1] The most conservative onshore case involves the seaward edge of the beach nearest the projects. The seascape unit edge is 3.45 miles (5.6 kilometers) offshore (New Jersey jurisdictional boundary).
[2] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, O = OSS, M = mid-tower light, Y = yellow tower base color.
[3] WTGs and OSS Prominence (visibility): 0 = Not visible. 1 = Visible only after extended study; otherwise not visible. 2 = Visible when viewing in general direction of the lease areas; otherwise likely to be missed by casual observer. 3 = Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 = Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 = Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 = Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).
[4] The seaward edge between landscape and seascape varies. The most conservative case is 0.2-mile (0.3-kilometer) landward distance from seaward beach edge.

Table H-52. NY Bight and other WTGs' cumulative open ocean, seascape, and landscape areas lease area distances, FOVs, noticeable elements, visual contrasts, scale of change, and prominence

Lease Area and Incremental Date	Distance in Miles (Kilometers)[1] and Impacts			FOV Degrees (% of 124°)			Noticeable Elements[2] and Impact Level	Visual Contrast, Scale of Change, and Prominence					
	Seascape[1]	Open Ocean	Landscape[4]	Seascape	Open Ocean	Landscape		Form	Line	Color	Texture	Scale	Prominence[3]
NY Bight (2030)	20.2 (32.6) **Moderate**	0 (0)–47.2 (68.4) **Major**	27.3 (44.0) **Minor**	136° (110%)	82° to 360° (66 to 290%)	136° (110%)	R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Atlantic Shores Offshore Wind South OCS-A 0499 (2026)	8.7 (14.0) **Major**	0 (0)–42.5 (68.4) **Major**	9.0 (14.5) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Atlantic Shores Offshore Wind North OCS-A 0549 (2030)	9.0 (14.5) **Major**	0 (0)–42.5 (68.4) **Major**	9.2 (14.8) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Empire Wind I and II OCS-A 0512 (2030)	14.1 (22.7) **Moderate**	0 (0)–40.7 (65.5) **Major**	34.9 (56.1) **Minor**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Ocean Wind 1 OCS-A-0498 (2025)	15.3 (24.6) **Major**	0 (0)–39.6 (63.7) **Major**	15.5 (24.9) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6
Ocean Wind 2 OCS-A532 (2030)	9.2 (14.7) **Major**	0 (0)–39.6 (63.7) **Major**	15.5 (24.9) **Major**				R, AL, N, H, O, M, Y Major	Strong	Strong	Strong	Strong	Large	6

[1] The most conservative onshore case involves the seaward edge of the beach nearest the projects. The seascape unit edge is 3.45 miles (5.6 kilometers) offshore (New Jersey jurisdictional boundary).
[2] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, O = OSS, M = mid-tower light, Y = yellow tower base color.
[3] WTGs and OSS Prominence (visibility): 0 = Not visible. 1 = Visible only after extended study; otherwise not visible. 2 = Visible when viewing in general direction of the lease areas; otherwise likely to be missed by casual observer. 3 = Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 = Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 = Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 = Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).
[4] The seaward edge between landscape and seascape varies. The most conservative case is 0.2-mile (0.3-kilometer) landward distance from seaward beach edge.

Table H-53. Non-NY Bight projects' cumulative viewer experience WTG distances, FOVs, noticeable elements, visual contrasts, scale of change, and prominence

KOP	Distance in Miles (Kilometers) and Impact: ASOW South[1]	ASOW North[1]	EW I and II[1]	OW 1[1]	OW 2[1]	FOV Degrees (% of 124°)	Noticeable Elements [2] and Impact Level	Visual Contrast, Scale of Change, and Prominence: Form	Line	Color	Texture	Scale	Prominence [3]
KOP-02 Lucy the Elephant	14.4 (23.2) **Major**	22.1 (35.6) **Moderate**	Not Visible	16.0 (25.8) **Moderate**	10.8 (17.3) **Major**	127.6° (103%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-04 John Stafford Beach Entrance	14.4 (23.2) **Major**	19.3 (31.0) **Moderate**	Not Visible	15.6 (25.1) **Moderate**	9.6 (15.5) **Major**	135.6° (109%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-05 Jim Whelan Hall Balcony	11.5 (18.4) **Major**	17.6 (28.4) **Moderate**	Not Visible	15.4 (24.8) **Moderate**	9.2 (14.7) **Major**	140.2° (113%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-08A/B Beach Haven – Day and Night	13.5 (21.7) **Major**	9.8 (15.8) **Major**	Not Visible	24.5 (39.4) **Minor**	20.2 (32.6) **Moderate**	139.7° (113%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-10 Barnegat Lighthouse (Elevation 157.2 feet)	27.3 (44.0) **Moderate**	10.1 (16.2) **Major**	50.2 (80.8) **Negligible**	38.6 (62.2) **Minor**	35.4 (57.0) **Minor**	169.6° (138%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-13 Mantoloking	Not Visible	25.8 (41.5) **Moderate**	34.1 (54.9) **Minor**	Not Visible	Not Visible	42° (34%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-18 Allenhurst Residential Historic District	Not Visible	39.0 (62.8) **Minor**	24.4 (39.3) **Moderate**	Not Visible	Not Visible	33.7° (27%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-26 Fort Tilden	Not Visible	Not Visible	21.2 (33.9) **Moderate**	Not Visible	Not Visible	15.7° (13%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-28 Jones Beach	Not Visible	Not Visible	14.2 (22.9) **Major**	Not Visible	Not Visible	52.4° (42%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-31 Westhampton Beach	Not Visible	Not Visible	37.9 (61.0) **Minor**	Not Visible	Not Visible	12.9° (10%)	R, AL Minor	Weak	Weak	Weak	Weak	Small	6
KOP-32 Fire Island Lighthouse (Elevation 154.7 feet)	Not Visible	Not Visible	21.7 (35.0) **Major**	Not Visible	Not Visible	61.7° (50%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-35 Twin Lights Lighthouse (Elevation 204 feet)	Not Visible	50.0 (80.5) **Minor**	22.4 (36.1) **Major**	Not Visible	Not Visible	20.5° (16%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-36 Ashbury Park Hall (Elevation 46.4 feet)	Not Visible	38.1 (61.4) **Minor**	24.9 (40.0) **Moderate**	Not Visible	Not Visible	114.8° (93%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-37 Point O' Woods	Not Visible	Not Visible	23.9 (38.5) **Moderate**	Not Visible	Not Visible	55.2° (44.5%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-39 Empire State Building (Elevation 1,263 feet)	Not Visible	74.2 (119.5) **Negligible**	34.1 (54.9) **Minor**	Not Visible	Not Visible	59.5° (48%)	R, AL, N, H, O, and M Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-40 Robert Moses – Nighttime	Not Visible	Not Visible	21.3 (34.2) **Major**	Not Visible	Not Visible	62.9° (51%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6

[1] ASOW South = Atlantic Shores Offshore Wind South OCS-A 0499 (1,049-foot [319.7-meter] WTGs), ASOW North = Atlantic Shores Offshore Wind North OCS-A 0549 (1,049-foot [319.7-meter] WTGs), EW I and II = Empire Wind OCS-A 0512 (951-foot [290-meter] WTGs), OW 1 = Ocean Wind 1 OCS-A-0498 (906-foot [276-meter] WTGs), and OW2 = Ocean Wind 2 OCS-A532 (906-foot [276-meter] WTGs). Due to EC, zero atmospheric refraction, and known WTG heights. WTGs beyond 42.6 miles (68.6 kilometers) would not be visible from ground level plus 5.9 feet (1.8 meters) viewing height.

[2] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, O = OSS, M = mid-tower light, Y = yellow tower base color.

[3] WTGs and OSS (onshore) visibility: 0 = Not visible. 1 = Visible only after extended study; otherwise not visible. 2 = Visible when viewing in general direction of the lease areas; otherwise likely to be missed by casual observer. 3 = Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 = Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 = Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 = Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

Table H-54. NY Bight and other lease areas' cumulative viewer experience, lease area distances, FOVs, noticeable elements, visual contrasts, scale of change, and prominence

KOP	Distance in Miles (Kilometers) and Impact							FOV Degrees (% of 124°)	Noticeable Elements [2] and Impact Level[3]	Visual Contrast, Scale of Change, and Prominence					
	NYB 1,312-foot WTGs[1]	NYB 853-foot WTGs[1]	ASOW South[1]	ASOW North[1]	EW I and II[1]	OW 1[1]	OW 2[1]			Form	Line	Color	Texture	Scale	Prominence [3]
KOP-02 Lucy the Elephant	46.3 (74.4) **Negligible**	Not Visible	14.4 (23.2) **Major**	22.1 (35.6) **Moderate**	Not Visible	16.0 (25.8) **Moderate**	10.8 (17.3) **Major**	127.6° (103%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-04 John Stafford Beach Entrance	43.8 (70.5) **Negligible**	Not Visible	14.4 (23.2) **Major**	19.3 (31.0) **Moderate**	Not Visible	15.6 (25.1) **Moderate**	9.6 (15.5) **Major**	135.6° (109%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-05 Jim Whelan Hall Balcony	42.3 (68.1) **Negligible**	42.3 (68.1) **Negligible**	11.5 (18.4) **Major**	17.6 (28.4) **Moderate**	Not Visible	15.4 (24.8) **Moderate**	9.2 (14.7) **Major**	140.2° (113%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-08A/B Beach Haven – Day and Night	32.6 (52.5) **Minor**	32.6 (52.5) **Minor**	13.5 (21.7) **Major**	9.8 (15.8) **Major**	Not Visible	24.5 (39.4) **Minor**	20.2 (32.6) **Moderate**	139.7° (113%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-10 Barnegat Lighthouse (Elevation 157.2 feet)	32.3 (52.0) **Moderate**	32.3 (52.0) **Minor**	27.3 (44.0) **Moderate**	10.1 (16.2) **Major**	50.2 (80.8) **Negligible**	38.6 (62.2) **Minor**	35.4 (57.0) **Minor**	169.6° (138%)	R, AL, N, H, O, and M Major	Strong	Strong	Strong	Strong	Large	6
KOP-13 Mantoloking	44.1 (71.0) **Minor**	Not Visible	Not Visible	25.8 (41.5) **Moderate**	34.1 (54.9) **Minor**	Not Visible	Not Visible	138.1° (111%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-18 Allenhurst Residential Historic District	42.5 (68.4) **Minor**	Not Visible	Not Visible	39.0 (62.8) **Minor**	24.4 (39.3) **Moderate**	Not Visible	Not Visible	116.2° (94%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-26 Fort Tilden - nighttime	43.7 (70.3) **Negligible**	Not Visible	Not Visible	Not Visible	21.2 (33.9) **Moderate**	Not Visible	Not Visible	20.0° (16%)	R, AL, N, H Moderate	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-28 Jones Beach	31.4 (50.5) **Minor**	31.4 (50.5) **Minor**	Not Visible	Not Visible	14.2 (22.9) **Major**	Not Visible	Not Visible	60.5° (49%)	R, AL, N, H Major	Strong	Strong	Strong	Strong	Large	6
KOP-31 Westhampton Beach	33.9 (54.5) **Minor**	33.9 (54.5) **Negligible**	Not Visible	Not Visible	37.9 (61.0) **Minor**	Not Visible	Not Visible	22.3° (18%)	R, AL Minor	Weak	Weak	Weak	Weak	Small	6
KOP-32 Fire Island Lighthouse (Elevation 154.7 feet)	24.2 (39.0) **Moderate**	24.2 (39.0) **Moderate**	Not Visible	Not Visible	21.7 (35.0) **Major**	Not Visible	Not Visible	82.8° (67%)	R, AL, N, H, O, and M **Major**	Strong	Strong	Strong	Strong	Large	6
KOP-35 Twin Lights Lighthouse (Elevation 204 feet)	44.1 (70.9) **Minor**	44.1 (70.9) **Minor**	Not Visible	50.0 (80.5) **Minor**	22.4 (36.1) **Major**	Not Visible	Not Visible	89.5° (72%)	R, AL, N, H **Major**	Strong	Strong	Strong	Strong	Large	6
KOP-36 Ashbury Park Hall (Elevation 46.4 feet)	42.6 (68.6) **Negligible**	42.6 (68.6) **Negligible**	Not Visible	38.1 (61.4) **Minor**	24.9 (40.0) **Moderate**	Not Visible	Not Visible	117.8° (95%)	R, AL, N, H **Moderate**	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-37 Point O' Woods	24.1 (38.7) **Moderate**	24.1 (38.7) **Moderate**	Not Visible	Not Visible	23.9 (38.5) **Moderate**	Not Visible	Not Visible	82.3° (66%)	R, AL, N, H, O, and M **Major**	Strong	Strong	Strong	Strong	Large	6
KOP-39 Empire State Building (Elevation 1,263 feet)	55.8 (89.8) **Minor**	55.8 (89.8) **Negligible**	Not Visible	74.2 (119.5) **Negligible**	34.1 (54.9) **Minor**	Not Visible	Not Visible	63.4° (51%)	R, AL, N, H, O, and M **Moderate**	Moderate	Moderate	Moderate	Moderate	Medium	3
KOP-40 Robert Moses – Nighttime	24.2 (39.0) **Major**	24.2 (39.0) **Major**	Not Visible	Not Visible	21.3 (34.2) **Major**	Not Visible	Not Visible	80.4° (65%)	R, AL, N, H, O, and M **Major**	Strong	Strong	Strong	Strong	Large	6

[1] NYB = six New York Bight leases, ASOW South = Atlantic Shores Offshore Wind South OCS-A 0499 (1,049-foot [319.7-meter] WTGs), ASOW North = Atlantic Shores Offshore Wind North OCS-A 0549 (1,049-foot [319.7-meter] WTGs), EW I and II = Empire Wind OCS-A 0512 (951-foot 9290-meter] WTGs), OW 1 = Ocean Wind 1 OCS-A-0498 (906-foot [276-meter] WTGs), and OW 2 = Ocean Wind 2 OCS-A532 (906-foot [276-meter] WTGs). Due to EC, zero atmospheric refraction, and known WTG heights. WTGs beyond 42.6 miles (68.6 kilometers) would not be visible from ground level plus 5.9 feet (1.8 meters) viewing height.

[2] Noticeable elements: R = rotor, AL = aviation light, N = nacelle, H = hub, O = OSS, M = mid-tower light, Y = yellow tower base color.

[3] WTGs and OSS (onshore) visibility: 0 = Not visible. 1 = Visible only after extended study; otherwise not visible. 2 = Visible when viewing in general direction of the lease areas; otherwise likely to be missed by casual observer. 3 = Visible after brief glance in general direction of the lease areas; unlikely to be missed by casual observer. 4 = Plainly visible; could not be missed by casual observer but does not strongly attract visual attention or dominate view. 5 = Strongly attracts viewers' attention to the lease areas; moderate to strong contrasts in form, line, color, or texture, luminance, or motion. 6 = Dominates view; strong contrasts in form, line, color, texture, luminance, or motion fill most of the horizontal FOV or vertical FOV (Sullivan et al. 2013).

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Appendix I: NHPA Section 106 Summary

I.1 Project Overview

I.1.1 Background

This document provides a summary of the Bureau of Ocean Energy Management's (BOEM's) compliance with Section 106 of the National Historic Preservation Act (NHPA or Section 106) and documents the agency's consultation process for the development of a Programmatic Agreement that will guide Section 106 project-level review of the Construction and Operation Plans (COPs) for six commercial wind energy lease areas (OCS-A 0537, 0538, 0539, 0541, 0542, and 0544) in the New York Bight (NY Bight). This Section 106 summary (Summary) is included as an appendix to the Programmatic Environmental Impact Statement (PEIS) being prepared in compliance with the National Environmental Policy Act (NEPA).

This is the first time that BOEM is developing a Programmatic Agreement for a grouping of lease areas after lease issuance and before submittal of COPs, but it builds from other efforts BOEM has made to identify programmatic solutions for meeting the agency's obligations under Section 106. BOEM has already implemented programmatic agreements pursuant to 36 Code of Federal Regulations (CFR) 800.14(b) to fulfill its obligations under Section 106 of the NHPA for renewable energy activities on the Outer Continental Shelf (OCS) offshore New York and New Jersey. These agreements have been developed for two primary reasons: first, BOEM's decisions to issue leases and approve plans (e.g. Site Assessment Plans [SAPs], COPs, or General Activity Plans [GAPs]) are complex and involve multiple stages of decision-making and multiple undertakings; and second, BOEM will not have the results of archaeological surveys prior to the issuance of leases or grants and, as such, will be conducting historic property identification and evaluation efforts in phases (36 CFR 800.4(b)(2)). The *Programmatic Agreement Among The U.S. Department of the Interior, Bureau of Ocean Energy Management, The State Historic Preservation Officers of New Jersey and New York, The Shinnecock Indian Nation, and The Advisory Council on Historic Preservation Regarding Review of Outer Continental Shelf Renewable Energy Activities Offshore New Jersey and New York Under Section 106 of the National Historic Preservation Act* (NJ-NY PA) was executed June 3, 2016[1] by BOEM, the State Historic Preservation Officers (SHPOs) of New York and New Jersey, and the Advisory Council on Historic Preservation (ACHP). This agreement provides for Section 106 consultation to continue through BOEM's decision-making process and allows for a phased identification and evaluation of historic properties (36 CFR 800.4(b)(2)).

The current programmatic review of the six NY Bight lease areas seeks to compile baseline information, where feasible, and identify key concepts to incorporate into a standardized process that will guide each of the six project-level reviews. By capturing the results in this Summary and a supplemental

[1] https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/HP/NY-NJ-Programmatic-Agreement-Executed.pdf

programmatic agreement for NY Bight, BOEM seeks to achieve greater consistency across the six lease areas while reducing the consultation burden for consulting Tribes, SHPOs, ACHP, and other parties.

I.1.2 Consultation with Tribes and Consulting Parties and Public Involvement

On July 15, 2022, BOEM contacted representatives of federally recognized Tribes, other federal agencies, state and local governments, preservation organizations, lessees of the six NY Bight lease areas, and other potentially interested consulting parties to determine their interest in participating as consulting parties. In the course of consultation activities, BOEM has identified additional organizations or agencies that may have an interest in the effects of offshore wind development on historic properties and has continued to invite such parties to participate in the programmatic Section 106 review. Consulting parties for the NHPA Section 106 Consultation of the NY Bight PEIS as of July 1, 2024, are listed in Table I-1. BOEM will continue consulting with federally recognized Tribes, New Jersey SHPO, New York SHPO, ACHP, and other consulting parties regarding the project-level review procedures and the development of Avoidance, Minimization, Mitigation, And Monitoring (AMMM) measures and Recommended Practices (RPs) that could be adopted at the individual COP NEPA-Section 106 review stage to resolve adverse effects on historic properties.

Table I-1. Participating Section 106 consulting parties for the NY Bight

Organization Type	Participating Consulting Parties
Federally Recognized Tribe	Absentee-Shawnee Tribe of Indians of Oklahoma
Federally Recognized Tribe	Delaware Tribe of Indians
Federally Recognized Tribe	Eastern Shawnee Tribe of Oklahoma
Federally Recognized Tribe	Mashantucket (Western) Pequot Tribal Nation
Federally Recognized Tribe	Mashpee Wampanoag Tribe
Federally Recognized Tribe	Mohegan Tribe of Connecticut
Federally Recognized Tribe	Stockbridge-Munsee Community Band of Mohican Indians
Federally Recognized Tribe	The Delaware Nation
Federally Recognized Tribe	The Narragansett Indian Tribe
Federally Recognized Tribe	The Shinnecock Indian Nation
Federally Recognized Tribe	Tuscarora Nation
Federally Recognized Tribe	Wampanoag Tribe of Gay Head (Aquinnah)
Federal Government	U.S. Advisory Council on Historic Preservation
Federal Government	U.S. Army Corps of Engineers
Federal Government	U.S. Bureau of Safety and Environmental Enforcement
Federal Government	U.S. Department of the Navy
Federal Government	U.S. Environmental Protection Agency
Federal Government	U.S. National Park Service
Lessee	Atlantic Shores Offshore Wind Bight (OCS-A 0541)
Lessee	Attentive Energy (OCS-A 0538)
Lessee	Bluepoint Wind (OCS-A 0537)
Lessee	Community Offshore Wind (OCS-A 0539)
Lessee	Invenergy (OCS-A 0542)
Lessee	Vineyard Mid-Atlantic Offshore Wind (OCS-A 0544)

Organization Type	Participating Consulting Parties
Local Government	Atlantic County
Local Government	Avon-by-the-Sea Borough
Local Government	Borough of Beach Haven
Local Government	Borough of Highlands
Local Government	Borough of Point Pleasant Beach
Local Government	Borough of Sea Bright
Local Government	Borough of Seaside Park
Local Government	Borough of Spring Lake
Local Government	Cape May County
Local Government	City of Absecon
Local Government	City of Asbury Park
Local Government	City of Hoboken
Local Government	City of North Wildwood
Local Government	Monmouth County
Local Government	Monmouth County Park System
Local Government	Nassau County
Local Government	Neptune City
Local Government	Suffolk County
Local Government	Town of Babylon
Local Government	Town of Islip
Local Government	Town of Oyster Bay
Local Government	Township of Brick
Local Government	Township of Hamilton
Local Government	Township of Middletown
Local Government	Township of Stafford
Local Government	Village of Bellport
Local Government	Village of Patchogue
Other Potentially Interested Parties	Green-Wood Cemetery
Other Potentially Interested Parties	Hempstead Harbor Protection Committee
Other Potentially Interested Parties	Point O' Woods Association
Preservation Organization	Bay Shore Historical Society
Preservation Organization	Greater Cape May Historical Society
Preservation Organization	Historic Districts Council
Preservation Organization	Historical Society of Highlands
Preservation Organization	Ocean City Historical Museum
Preservation Organization	Preservation Alliance of Spring Lake
Preservation Organization	Romer Shoal Light
Preservation Organization	Save Long Island Beach Inc.
Preservation Organization	The Noyes Museum of Art
Preservation Organization	West Bank Lighthouse
State Government	New Jersey State Museum
State Government	New York State Parks, Recreation & Historic Preservation, Long Island State Parks Region 9
State Government	New York State Parks, Recreation and Historic Preservation

Organization Type	Participating Consulting Parties
State Government (SHPO)	New Jersey Department of Environmental Protection, Historic Preservation Office
State Government (SHPO)	New York State Historic Preservation Office
State Recognized Tribe	Lenape Indian Tribe of Delaware

BOEM conducted Section 106 early coordination meetings with ACHP on September 7, 2022, and with the New Jersey and New York SHPOs and ACHP on September 21, 2022 and January 10, 2023. BOEM conducted a Section 106 consultation meeting with consulting parties on March 13, 2023, to introduce the objectives for the NY Bight programmatic Section 106 review and solicit input on the development of the Programmatic Agreement. BOEM conducted a second Section 106 consultation meeting on August 3, 2023, to present an introduction to BOEM's analysis of impacts on scenic and visual resources including a preview of the development of photo simulations of development scenarios for the NY Bight lease areas and to provide an overview of BOEM's progress on the development of the Programmatic Agreement. BOEM conducted a third Section 106 consultation meeting on February 15, 2024, to present the responses to consulting party comments and the revised Programmatic Agreement. BOEM conducted a fourth Section 106 consultation meeting on June 20, 2024, to present the responses to consulting party comments and the third version of the draft Final Programmatic Agreement.

I.1.3 Programmatic Area of Potential Effect

BOEM has developed a NY Bight programmatic area of potential effects (Programmatic APE) in accordance with implementing regulations at 36 CFR part 800 (Protection of Historic Properties). In 36 CFR 800.16(d), the APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alteration in the character or use of historic properties, if any such properties exist."

BOEM (2020) further defines the APE as the following and pursuant to the Section 106 regulations definition of an APE (36 CFR 800.16(d)):

- The depth and breadth of the seabed potentially impacted by any bottom-disturbing activities;
- The depth and breadth of terrestrial areas potentially impacted by any ground-disturbing activities;
- The viewshed from which renewable energy structures, whether located offshore or onshore, would be visible;
- Any temporary or permanent construction or staging areas, both onshore and offshore.

BOEM has formed the Programmatic APE to facilitate the preliminary identification of historic properties listed in the National Register of Historic Places (NRHP) subject to potential effects from anticipated offshore wind development in the NY Bight area; initiate consultations with consulting parties; and analyze the implementation of potential AMMM measures for avoiding or reducing adverse effects on historic properties. Specific information, such as cable routes, landfall locations, and onshore transmission routes are not available at this time. Based on general information obtained from the lessees and other consulting parties, BOEM has defined a conservative Programmatic APE meant to encapsulate future COP-specific APEs when that information becomes available. BOEM will require each lessee to complete the requisite cultural resource technical studies per BOEM (2020) historic property identification guidelines including, but not limited to, the preliminary delineation of an APE per the COP Project Design Envelope (PDE), completion of associated cultural resource and historic property identification efforts, assessment of potential effects, consideration of relevant RPs as listed in Table 3.6.2-8 of the PEIS, and development of potential AMMM measures for identified historic properties. BOEM will then delineate the COP APE and assess the specific impacts for the PDEs of each NY Bight lease area in COP-specific NEPA and Section 106 reviews and consultations.

For the purposes of this analysis, cultural resources are divided into several types and subtypes as defined in Table I-2. Discussion of the cultural resource types in this section is further organized by their known or potential presence in the Programmatic APE.

Table I-2. Definitions of cultural resource types used in the analysis

Term	Definition
Ancient submerged landform feature	*Ancient submerged landform features* are landforms that have the potential to contain Native American archaeological resources inundated and buried as sea levels rose at the end of the last Ice Age. Additionally, Tribal Nations in the region may consider ancient submerged landform features to be independent or contributing elements to previously subaerial TCPs representing places where their ancestors once lived.
Cultural landscape	The National Park Service (2006) defines a *cultural landscape* as a “geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values.” In this analysis, cultural landscapes are considered a type of historic aboveground resource.
Cultural resource	The phrase *cultural resource* refers to a physical resource valued by a group of people such as an archaeological resource, building, structure, object, district, landscape, or TCP. Cultural resources can date to the pre-Contact or post-Contact periods (i.e., respectively, the time prior to written records and thereafter) and may be listed on national, state, or local historic registers or be identified as important to a particular group during consultation, including any of those with cultural or religious significance to Tribal Nations. Cultural resources in this analysis are divided into several types and subtypes: marine cultural resources, terrestrial archaeological resources, historic aboveground resources, and TCPs.
Marine archaeological resource	*Marine archaeological resources* are the physical remnants of past human activity that occurred at least 50 years ago and are submerged underwater. They may date to the pre-Contact period (e.g., those inundated and buried as sea levels rose at the end of the last Ice Age) or post-Contact period (e.g., shipwrecks, downed aircraft, and related debris fields).
Historic aboveground resource	*Historic aboveground resources* are subaerial features or structures of cultural significance at least 50 years in age and include those that date to the pre-Contact or post-Contact periods. Example types that are or may have historic aboveground components include standing buildings, bridges, dams, historic districts, cultural landscapes, and TCPs.

Term	Definition
Historic district	A *historic district* is an area composed of a collection of either or both archaeological and aboveground cultural resources.
Historic property	As defined in 36 CFR 800.16(l)(1), the phrase *historic property* refers to any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the [NRHP] maintained by the Secretary of the Interior. The term includes artifacts, records, and remains that are related to and located within such properties." *Historic property* also includes NHLs as well as properties of traditional religious and cultural importance to Native American Tribal Nations that meet NRHP criteria. The NRHP recognizes historic properties that are significant at the national, state, and local levels that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that meet any of Criterion A through D. Criterion A covers a historic property that is associated with events that are significant to the broad patterns of our history. Criterion B covers a historic property associated with the lives of persons significant to our past. Criterion C covers a historic property that embodies distinctive characteristics of a type, period, or method of construction; represents the work of a master or possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction. Criterion D covers a historic property that yields, or may be likely to yield, information important to prehistory or history.
Terrestrial archaeological resource	*Terrestrial archaeological resources* are the physical remnants of past human activity that occurred at least 50 years ago and are located on or within lands not submerged underwater. They may date to the pre-Contact period (i.e., have associations with Native American populations dating to before European colonization of the Americas) or post-Contact period (i.e., have associations with African American, European American, or Native American populations dating to after European colonization of the Americas).
Traditional cultural property	National Register Bulletin 38 (Parker and King 1990, revised 1992 and 1998) defines a *traditional cultural property* as a "[historic property] that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community." TCPs may be locations, places, or cultural landscapes and have either or both archaeological and aboveground elements.

NHL = National Historic Landmark; TCP = traditional cultural property.

I.1.3.1 Marine Portion of the Programmatic APE

When delineating the marine portion of the APE during the COP-stage review, BOEM considers the potential for the construction of offshore project components to physically disturb marine archaeological resources or ancient submerged landforms (ASLFs), either of which may qualify as historic properties. Delineating the area within which such effects may occur requires consideration of the locations where turbines or substations will be anchored to the seafloor within the lease area, as well as the corridors within which the interarray cables, transmission cables, and other project components may disturb the seabed between the lease area and coastal landfall. Other project activities that have the potential to physically disturb marine archaeological resources, such as interarray cables or use of anchors by vessels conducting surveys or supporting construction, may warrant expansion of the Marine APE.

The programmatic review of the NY Bight lease areas does not include delineation of a marine portion of the Programmatic APE due to the lack of complete project-specific design or layouts. In particular, the Programmatic APE has not considered other offshore areas, aside from the six NY Bight lease areas, potentially physically affected by seabed-disturbing activities (i.e., other marine areas in which temporary or permanent construction or staging areas are proposed to occur, such as offshore export cable route corridors and horizontal directional drilling [HDD] locations, which may have physical impacts on historic properties). Therefore, the potential for adverse effects will be considered based on hypothetical project activities that are typical of offshore wind renewable energy projects.

I.1.3.2 Terrestrial Portion of the Programmatic APE

When delineating the terrestrial portion of the APE, BOEM considers the potential for construction of onshore project components to physically disturb archaeological historic properties during ground-disturbing activities. Delineating the area within which such effects may occur requires locational information for where the subsea cables will make landfall, the location of terrestrial substations/converter stations, and the proposed routes for transmission, none of which are currently available. In addition to the location for such project components, the terrestrial APE needs to consider the maximum horizontal area and maximum vertical depth of ground disturbance at those locations.

The programmatic review of the NY Bight lease areas does not include delineation of a terrestrial portion of the Programmatic APE due to the lack of project-specific information about onshore areas potentially physically affected by ground-disturbing activities. Instead, the potential for adverse effects will be considered based on hypothetical project activities that are typical of offshore wind renewable energy projects.

I.1.3.3 Visual Portion of the Programmatic APE

When delineating the visual portion of the APE, BOEM considers the potential for offshore project components to cause adverse effects on onshore aboveground historic properties in those instances where a maritime view is a character-defining feature of the historic property and the introduction of the offshore wind facilities would reduce the integrity of that view. Delineating the area within which such effects may occur requires consideration of the viewshed modeling that is conducted according to BOEM’s guidance for Visual Impacts Analysis (VIA).

For the programmatic review of the six lease areas in the NY Bight, BOEM has established a general study area for the visual analysis based on preliminary viewshed modeling (see Figure I-1). In general, the study area considers the visibility of a wind turbine generator (WTG) from the water level to the tip of an upright rotor blade at a height of 1,312 feet (400 meters), which is the maximum height of turbines considered in the PEIS Representative Project Design Envelope (RPDE) (refer to Chapter 2, Table 2-2 of the PEIS). This can be broken down to consider visibility from ground level or from an elevated viewpoint (such as the lookout room of a lighthouse or upper floors of a multi-story hotel). Such modeling can also consider visibility of the safety lights at the mid-level of the turbine, the hub of the turbine blades, or even the tip of the blades.

Geographic information system analysis was used to refine the study area and define a programmatic visual APE methodically through a series of steps. Once the study area was established (maximum theoretical distance WTGs could be visible), the analysis then accounted for how distance and Earth curvature impede visibility as the distance increases between the viewer and WTGs. This area was refined through computer modeling with the addition of a land cover vegetation layer to account for large areas of tall vegetation that limit projected visibility to a NY Bight project. Data layers for building footprints and building heights were then added to account for existing development projected to screen views to the NY Bight lease areas. Locations with unobstructed views of offshore elements then constituted the offshore visual APE (see Figure I-2).

The visual portion of the APE also includes consideration of the potential for onshore activities to include project components that cause adverse effects on onshore aboveground historic properties where introduction of the modern infrastructure would be incompatible with the historic character of the affected historic property. Such components may include cable landing locations, connection points where underground transmission lines connect aboveground, substations, switching stations, and overhead transmission line routes.

For the programmatic review of the six lease areas in the NY Bight there is not enough detail known about where the onshore project components will be located, so the onshore visual portion of the Programmatic APE has not been delineated. At the project specific review stage, these elements will be sited and can be mapped. Consultation regarding the potential for visual adverse effects on onshore aboveground historic properties will focus on the types of impacts caused by onshore facilities that typically support offshore wind developments, rather than specific effects to specific historic properties.

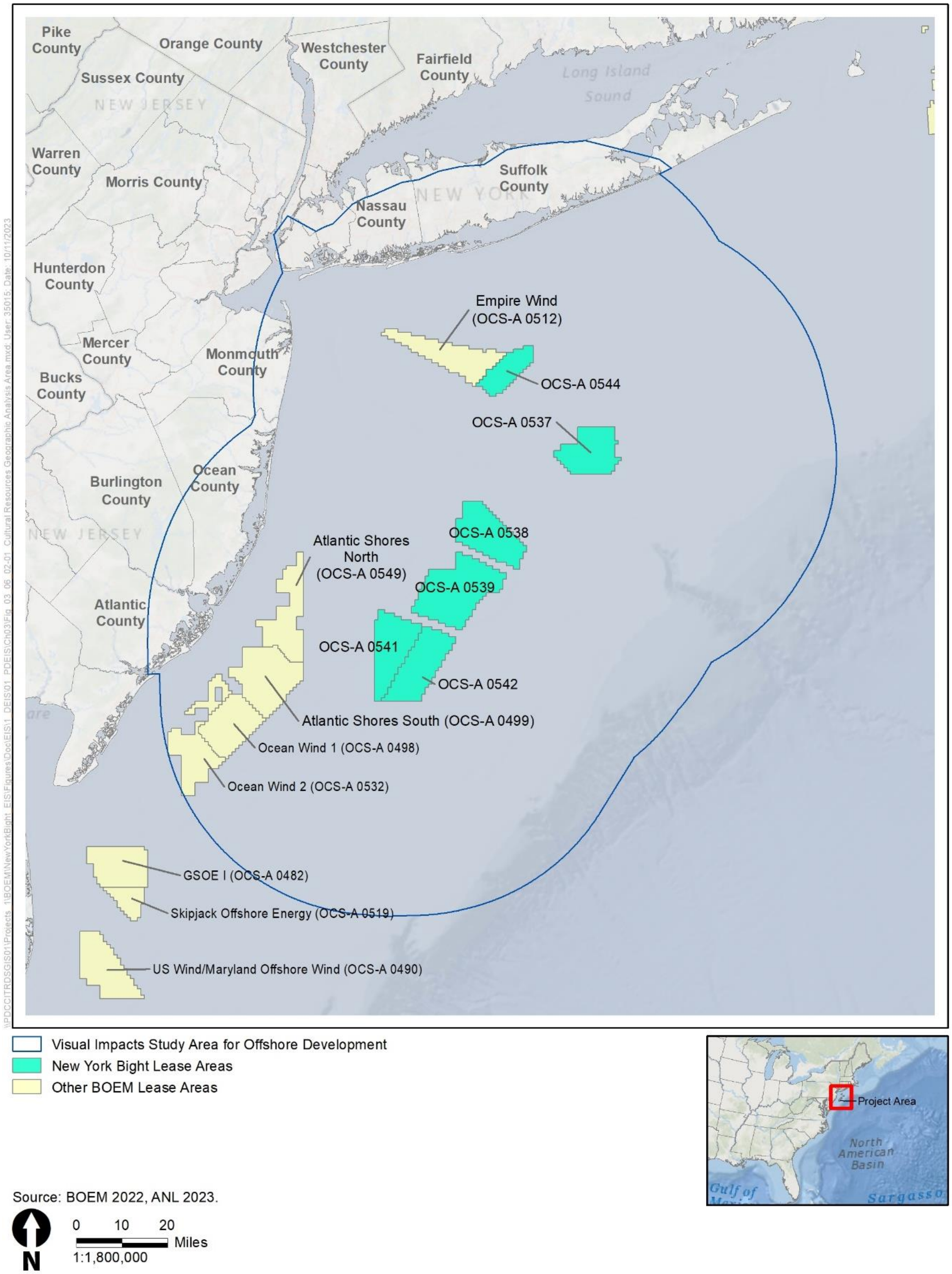

Figure I-1. Offshore visual impacts study area

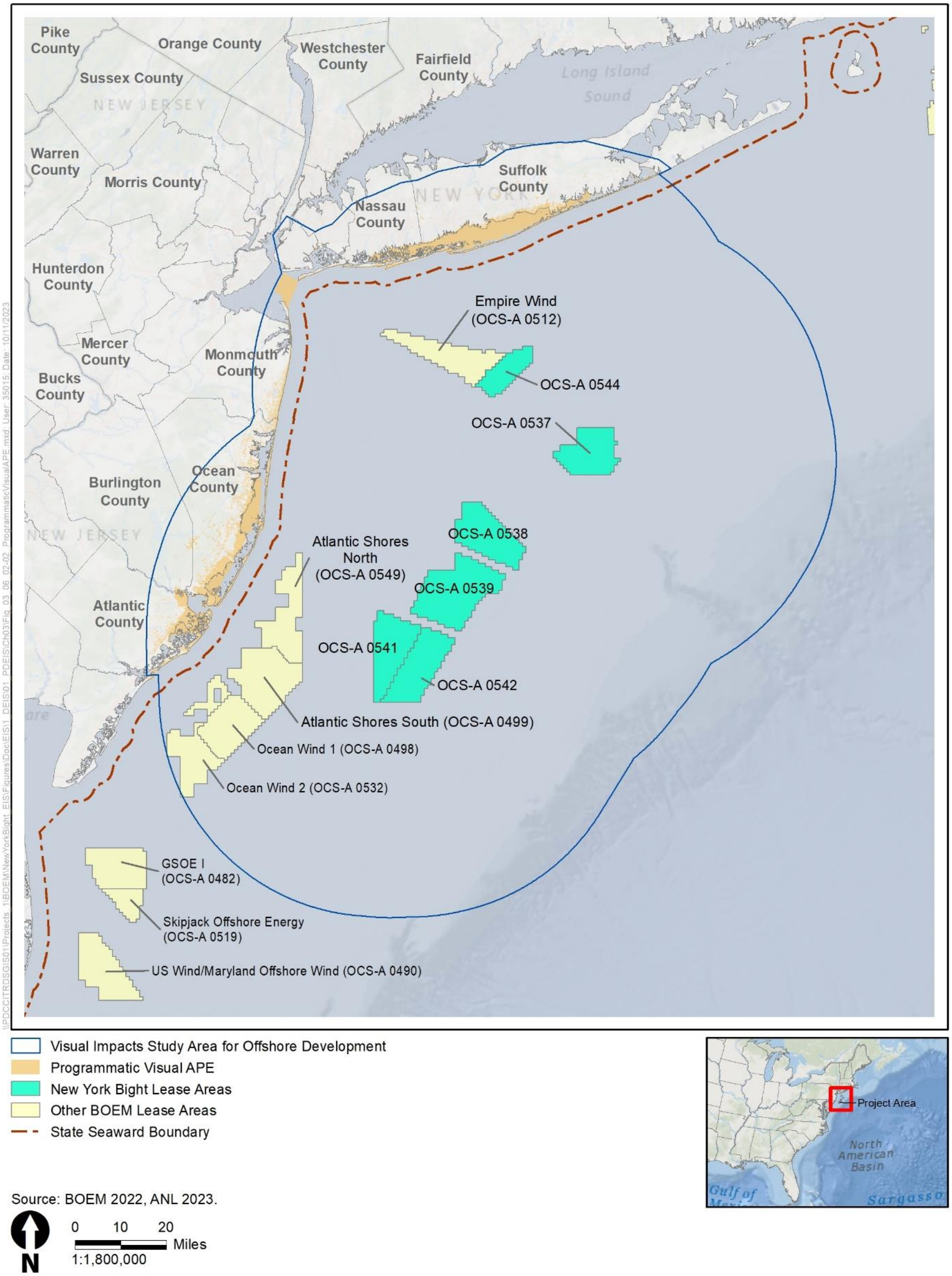

Figure I-2. Programmatic offshore visual APE

I.2 Historic Property Identification

I.2.1 Background Research

Background research and development of cultural and historic contexts were conducted by BOEM for the 2021 NY Bight Environmental Assessment, which assessed the potential impacts of the issuance of leases within the NY Bight wind energy areas (WEAs) and granting of easements, rights-of-way, and rights-of-use (BOEM 2021). These contexts have been incorporated into the PEIS and this Summary.

Table I-3 summarizes the cultural context of the Programmatic APE in New Jersey and New York (BOEM 2021).

Table I-3. Cultural context for the New York Bight cultural resources geographic analysis area

Period	Date	Description
Pre-Contact (Paleoindian)	15,000–10,000 BP	Semi-nomadic hunting and gathering populations. Use of broad spectrum of plants and animals for subsistence. Characteristic fluted projectile points used to hunt now-extinct large megafauna (mammoth and mastodon). Landscape of spruce forest. Sea levels about 330 feet (100 meters) below present-day levels. Sea level rise occurred with episodes of melting of the North American ice sheet. Deeply incised drainages along the OCS would have been estuarine environments utilized as a source of food and fresh water and habitation by Paleoindian populations. Flooding of these drainages allowed for sediment flows to bury possible Paleoindian sites.
Pre-Contact (Archaic)	10,000–3,000 BP	Period subdivided into Early (10,000–8,000 BP), Middle (8,000–6,000 BP), and Late (6,000–3,000 BP) phases. Gradual shift to modern environmental conditions with overall warmer temperatures and less precipitation relative to previous period. Spruce and pine forests gradually transition to mixed deciduous forest (hickory, oak, chestnut). Sea level had risen to about 75 feet (23 meters) below present-day levels by the Early Archaic and stabilized around 1.5–6.5 feet (0.5–2 meters) below present-day levels by the Late Archaic. Mobility of hunting and gathering populations decreased as environmental conditions stabilized. Population density increased and seasonal settlements were common with introduction of a broad range of seasonal food sources, including shellfish and other riverine and marine resources. Diverse types of stone tools used including ground stone vessels.
Pre-Contact (Woodland)	3,000–400 BP	Period subdivided into Early (3,000–2,000 BP), Middle (2,000–1,000 BP), and Late (1,000–400 BP) phases. Cooler and wetter climate in Early Woodland, then warming and drying trend begins in Middle Woodland. Mixed deciduous forests persist. Terrestrial foraging and intensive exploitation of marine food sources. Increasing sedentism with use of agriculture. Use of ceramic pots for cooking and storage. Triangular projectile points with introduction of bow and arrow by Late Woodland.
Post-Contact	17th Century AD	Native Americans settle in sedentary villages supported by agriculture and seasonal camps targeting large and small game, plants, riverine, and marine resources. Similar technologies to Late Woodland but increasing use of European trade goods. Interactions occur among Native Americans and European colonists. Dutch, Swedish, English colonies established. New Amsterdam colony established on Manhattan Island in 1625. New Sweden colony established in New Jersey in 1638. English colonists control the region by 1664.

Period	Date	Description
Post-Contact	18th Century AD	Shipbuilding and fish, tobacco, and fur trade industries thrive. First lighthouses on the Atlantic Seaboard are completed, including Sandy Hook in 1764. Ongoing conflicts between English and French colonists and their Native American allies. During the American Revolutionary War, many engagements between British and Continental forces took place in New Jersey and New York. Statehood granted to New Jersey in 1787 and to New York in 1788.
Post-Contact	19th Century AD	Manufacturing drives the economy during the Industrial Revolution. Cities grow as electricity is introduced and transportation improved through growth of public roadways, railroads, and canals. Iron and zinc mines become leading industries in New Jersey. New York City is a financial center during the American Civil War and remains a major ocean port and immigration hub. Ellis Island opened 1892.
Post-Contact	20th Century AD	African American populations increase with post-Civil War northward migrations. New Jersey and New York shipyards, factories, and refineries support military efforts in World War I and World War II. Many forts and training camps are active, and Port of New York used for troop deployments. Rail connections with larger urban areas and later improved roadways for automobiles led to growth of seaside communities. Urban decay in 1950s resulting from suburban growth.

Source: BOEM 2012; BOEM 2021.
AD = Anno Domini; BP = before present.

I.2.2 Historic Properties in the Marine Portion of the Programmatic APE

Marine cultural resources in the region include pre- and post-Contact marine archaeological resources and ASLFs on the OCS (BOEM 2012). Based on known historic and recent maritime activity in the region, the NY Bight lease areas have a high probability for containing shipwrecks, downed aircraft, and related debris fields that may be subject to potential impacts by seabed-disturbing activities from offshore wind development in the NY Bight area (BOEM 2012, 2021). These resources include both known and potential shipwrecks and related debris fields from the post-Contact period or last 50 years. ASLFs also have a high probability of occurrence on the OCS (BOEM 2012).

BOEM is consulting with the Naval History and Heritage Command on the potential marine resources as well as pertinent regulations protecting those resources. According to the Naval History and Heritage Command, within the cultural resources geographic analysis area for New York Bight, there are expected to be over 100 sunken military craft. These craft range in age from the late eighteenth to the twenty-first century. Several of these craft are owned by the Department of the Navy, whereas the remainder are owned by other U.S. government agencies, are foreign military craft, or their country of origin is unidentified. The type of craft represented in the Department of the Navy collection spans a wide spectrum, including, but not limited to, wooden sailing vessels, steamboats, destroyers, submarines, and aircraft. All sunken military craft are protected from unauthorized disturbance by the Sunken Military Craft Act of 2004. While the larger study area hosts a large number of sunken military craft, there are presently no known sunken military craft within the six lease areas themselves. (Krueger 2024.)

BOEM does not have enough information at this time about specific marine archaeological resources or ASLFs that may be present in the Programmatic Marine APE. BOEM will require each NY Bight lessee to conduct identification efforts for marine archaeological resources and ASLFs and present findings in a Marine Archaeological Resources Assessment (MARA) report prepared in partial fulfillment of a sufficient COP. This should include incorporation of information about marine cultural resources that have been identified as historic properties in the course of NEPA and Section 106 review of other nearby COPs (e.g., Empire Wind Offshore Wind [OCS-A 0512]), as the APE for those projects may overlap with the Programmatic APE for the NY Bight lease areas.

I.2.3 Historic Properties in the Terrestrial Portion of the Programmatic APE

The programmatic review of the NY Bight lease areas does not include delineation of a terrestrial portion of the Programmatic APE due to the lack of project-specific information about onshore areas potentially physically affected by ground-disturbing activities, and thus background research performed at this stage is unable to identify specific terrestrial archaeological resources for the programmatic review. BOEM will require each NY Bight lessee to conduct identification efforts for terrestrial archaeological resources and present findings in a Terrestrial Archaeological Resources Assessment (TARA) report prepared in partial fulfillment of a sufficient COP. This should include incorporation of information about terrestrial archaeological resources that have been identified as historic properties in the course of NEPA and Section 106 review of other lease areas that have already progressed into or completed NEPA and Section 106 review for their COPs, as the APE for those projects may overlap with the Programmatic APE for the NY Bight lease areas.

I.2.4 Historic Properties in the Visual Portion of the Programmatic APE

The viewshed of hypothetical offshore renewable energy structures constructed within the six NY Bight lease areas encompasses historically developed and densely occupied coastal areas of New Jersey and New York. As such, a large number of historic aboveground resources are anticipated to be located in the Programmatic Visual APE, of which a proportion are anticipated to be historic properties or potential historic properties listed or eligible for listing in the NRHP. These aboveground historic properties may include buildings, historic districts, cultural landscapes, and traditional cultural properties (TCPs). BOEM will require each NY Bight lessee to conduct identification efforts for historic aboveground resources and present findings in a Historic Resource Visual Effects Assessment (HRVEA) report prepared in partial fulfillment of a sufficient COP. BOEM will fully analyze impacts on such resources in COP-specific NEPA and Section 106 reviews and consultations.

I.3 Assessing Effects on Historic Properties

The effects of the NY Bight projects on historic properties cannot be fully analyzed at this time, as the layout and design details for each project are not yet known. However, in the course of conducting the analysis for the PEIS, and through input gained during the Section 106 consultation meetings, BOEM has been able to draw certain assessments and recommendations about types of effects that are likely to occur. The following section discusses the thresholds and methods for considering effects during the COP-level reviews, and is intended to create consistency across the six projects, which in turn will support more focused and meaningful project-level Section 106 consultation.

I.3.1 Criteria of Adverse Effect

The Criteria of Adverse Effect under NHPA Section 106 (36 CFR 800.5(a)(1)) states that an undertaking has an adverse effect on a historic property if the following occurs: “when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.…Adverse Effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.” According to regulation, adverse effects on historic properties include, but are not limited to (36 CFR 800.5(a)(2)):

i. Physical destruction of or damage to all or part of the property;

ii. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary of the Interior’s standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;

iii. Removal of the property from its historic location;

iv. Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance;

v. Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features;

vi. Neglect of a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian Tribe or Native Hawaiian organization; and

vii. Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property’s historic significance.

I.3.2 Marine Cultural Resources

Marine cultural resources in the region include pre- and post-Contact marine archaeological resources and ASLFs on the OCS (BOEM 2012). Based on known historic and recent maritime activity in the region, the NY Bight lease areas, composing the knowable Programmatic Marine APE, have a high probability for containing shipwrecks, downed aircraft, and related debris fields that may be subject to potential impacts by seabed-disturbing activities from offshore wind development in the NY Bight area (BOEM 2012, 2021). However, as mentioned in Section 3.6.2, *Cultural Resources,* the totality of cultural resources and historic properties in the Programmatic APE is not knowable at this time, and, therefore, while the background research performed at this stage has informed development of the cultural context and general sensitivity for marine cultural resources and ASLFs, BOEM does not have enough information to identify any specific marine archaeological resources or ASLFs that may be present in the Programmatic Marine APE.

Marine cultural resources such as shipwrecks and downed aircraft may be individually eligible for listing in the NRHP under Criterion A, B, or D. ASLFs may be individually eligible for listing in the NRHP or considered contributing elements to a TCP eligible for listing in the NRHP. ASLFs in the marine APE are considered archaeologically sensitive. If undiscovered archaeological resources are present within the identified ASLFs and they retain sufficient integrity, these resources could be eligible for listing in the NRHP under Criterion D, which is a resource that yields or may be likely to yield information important in prehistory or history. Furthermore, ASLFs are considered by Tribal Nations in the region to be culturally significant resources as the lands where their ancestors lived and as locations where events described in tribal histories occurred prior to inundation. BOEM recognizes these landforms could be eligible for listing in the NRHP under Criterion A.

The severity of project effects would depend on the extent to which integral or significant components of affected marine archaeological resources or ASLFs are disturbed, damaged, or destroyed, resulting in the loss of contributing elements to the historic property’s eligibility for listing in the NRHP.

I.3.3 Terrestrial Archaeological Resources

The severity of effects would depend on the extent to which integral or significant components of affected archaeological resources are disturbed, damaged, or destroyed, resulting in the loss of contributing elements to the historic property’s eligibility for listing in the NRHP.

I.3.4 Historic Aboveground Resources

BOEM’s delineation of the visual portion of the Programmatic APE utilized a conservative viewshed from which hypothetical offshore wind structures in all six NY Bight lease areas measuring 1,312 feet (400 meters) in height would be visible (1,312 feet [400 meters] is the maximum height of turbines considered in the PEIS RPDE [refer to Chapter 2, Table 2-2]). As the developer for each lease area finalizes the layout within the lease area and the specifications for their offshore wind structures, the lease-specific preliminary APE can be delineated using the same methods that were used for the Programmatic APE. It is reasonable to expect that the viewsheds for each of the lease areas will be different from the hypothetical scenario analyzed in the programmatic review. The development of those APEs and the analysis that follows will be more credible in general, and consistent between lease areas, by using the methods developed during the programmatic review.

Assessing the effect of offshore project components generally involves the following steps:

1. Briefly summarize the historical significance of the historic property.
2. Characterize the views that comprise the character-defining views as they relate directly to the significance of the historic property. Include all character-defining views, both maritime and otherwise.

3. Describe what can be identified from Google Earth or Street View about other features in the vicinity that currently affect views from the historic property toward the character-defining maritime views (such as tall buildings between the property and the ocean, or if the property is on elevated ground).
4. Explain what can be extrapolated from the VIA performed for scenic resources, focusing on the nearest key observation point (KOP) and associated visual simulations.
5. State how all of the above would alter the historical integrity of the character-defining views, discussing the aspects of integrity related to feeling and setting relative to how one experiences the maritime character-defining views, and the aspect of association relative to how one understands the functional role of the ocean in the property's significance.
6. Conclude with a recommended finding of effect.

I.3.4.1 NY Bight Programmatic Visual Impact Analysis Key Observation Points

BOEM conducted an assessment of seascape, landscape, and visual impacts for the NY Bight lease areas, which is presented in Appendix H, *Seascape, Landscape, and Visual Impact Assessment*, and includes information on KOPs in the geographic analysis area and viewshed maps that depict what onshore areas will have visibility of the WTGs in the NY Bight lease areas. Visual simulations of the NY Bight projects and other ongoing and planned offshore wind projects in the geographic analysis area, produced by Truescape under contract to BOEM, are posted to BOEM's website for NY Bight: https://www.boem.gov/renewable-energy/state-activities/new-york-bight.

Designated KOP distances to the NY Bight projects' WTG and offshore substation (OSS) array would range from:

- 44.7 miles (71.9 kilometers) from KOP-30 Shinnecock Inlet near the northern extent of the study area;
- 24.1 miles (38.8 kilometers) from KOP-37 Point O' Woods, the closest New York KOP to the WTG array;
- 31.2 miles (50.2 kilometers) from KOP-09 Barnegat Jetty, the closest New Jersey KOP to the WTG array; and
- 49.1 miles (79.0 kilometers) from KOP-01 Ocean City Music Hall at the southern extent of the study area.

Figure I-3 illustrates the location of the KOPs relative to the visibility distances for the tower base (yellow), OSS (blue), mid-tower light (orange), hub, nacelle, and aviation lights (pink), and rotor tip blade (purple) for 1,312-foot (400-meter) WTGs. A total of 40 KOPs were selected for analysis as part of NY Bight's programmatic VIA. Of these, 26 locations were selected for their usefulness to the Section 106 programmatic review and consultation; these are the KOPs shown on Figure I-3. Table I-4 provides information about the 26 KOPs that represent historic properties or other locations relevant to the Section 106 programmatic review.

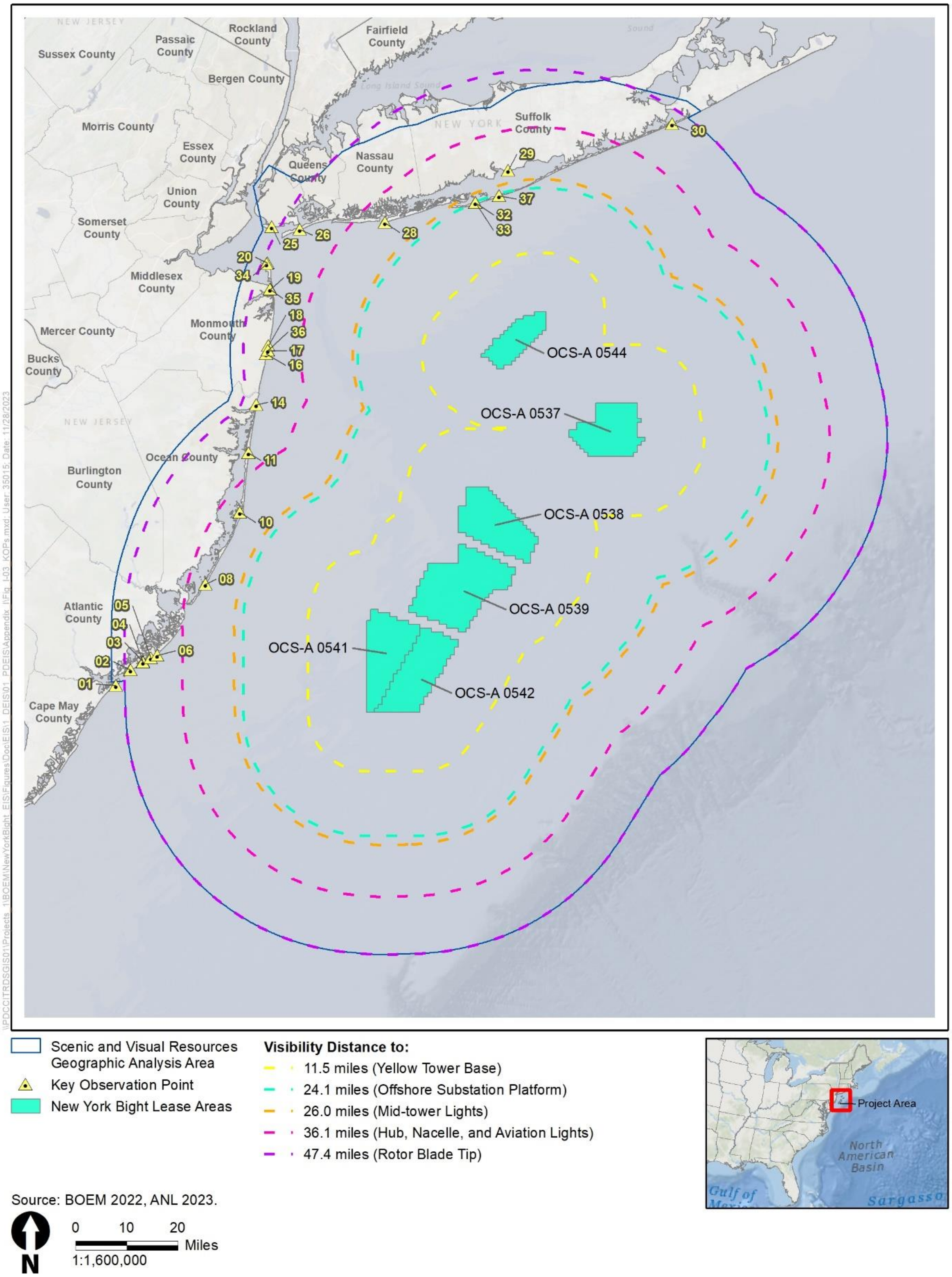

Figure I-3. Key observation points for NY Bight programmatic visual impact analysis

Table I-4. Key observation points that are also historic properties

KOP No.	Name	Rationale for Inclusion	Distance (miles) to nearest WTG/OSS	Simulation?
1	Ocean City Music Hall	Potential historic property	49.1	No
2	Lucy the Margate Elephant NHL	NHL with maritime setting/ocean view	46.3	Yes
3	Stafford Historic District/John Stafford Hall - Boardwalk	Historic property	43.8	No
4	Stafford Historic District/John Stafford Beach Entrance	Historic property	43.8	Yes
5	Atlantic City Convention Hall (Jim Whelan Hall) - Balcony	NHL with maritime setting/ocean view	42.3	Yes
6	Atlantic City Boardwalk - Ocean Casino Boardwalk View	Potential historic property	41.0	No
8	Beach Haven Historic District (Day and Night)	Historic property	32.6	Yes
10	Barnegat Lighthouse	Historic property	32.3	Yes
11	US Life Saving Station #14	Historic property	39.3	No
14	Bayhead Historic District	Historic property	44.5	No
16	Ocean Grove Historic District	Historic property	42.9	No
17	Asbury Park Beach and Convention Hall Balcony	Potential historic property	42.6	No
18	Allenhurst Residential Historic District	Historic property	42.5	Yes
19	Navesink Twin Lights NHL	NHL with maritime setting/ocean view	44.0	No
20	Sandy Hook Light NHL	NHL with maritime setting/ocean view	46.3	No
25	Coney Island Boardwalk	NHL with maritime setting/ocean view	48.8	No
26	Fort Tilden/Jacob Riis Park Historic District	Historic property	43.7	Yes
28	Jones Beach	Historic property	31.4	Yes
29	Rudolph Oyster House	NHL with maritime setting/ocean view	28.4	No
30	Shinnecock Inlet	Near Tribal territory	44.7	Yes
32	Fire Island Lighthouse - Upper Deck	Historic property	24.2	Yes
33	Fire Island Lighthouse - Base	Historic property	24.2	No
34	Sandy Hook Observatory NHL	NHL with maritime setting/ocean view	46.4	No
35	Navesink Light Station - Twin Lights Lighthouse NHL	NHL with maritime setting/ocean view	44.1	Yes
36	Asbury Park Hall	Potential historic property	42.6	Yes
37	Point O' Woods	Potential historic property	24.1	Yes

NHL = National Historic Landmark
Historic property = previously identified as eligible for or listed in the NRHP
Potential historic property = identified by BOEM or a consulting party as the location of a resource that requires further study to determine if it qualifies as an historic property.

I.3.5 Representative Visual Effects Analysis

The objective of a visual effects analysis is to assess how the introduction of offshore development (WTGs, OSSs) would change the relationship between an individual historic property and its maritime views, which could alter several aspects of historical integrity including feeling, setting, and association. It is important to note that not every historic property that has a view of the ocean necessarily relies on that maritime view to define its historical integrity. Each lessee will prepare project-level documentation of historic properties located within the preliminary APE for their lease, and must include a discussion of whether the maritime view is a character-defining feature of each NRHP eligible or listed historic property.

The effects of the project, and of cumulative effects of multiple projects, will need to be individually assessed for each historic property, based on its unique historical significance, relationship with the maritime view, and interpretation of the visual simulations for the nearest KOP. The programmatic consideration of potential effects is based on two WTG heights corresponding to the maximum and minimum heights in the PEIS RPDE: 1,312 feet (400 meters) and 853 feet (260 meters). By evaluating both heights, the analysis discloses the maximum and minimum impacts that may occur as a result of development in the six NY Bight lease areas.

In general, for each historic property whose historical significance is associated with the maritime setting and that has retained the integrity of its maritime view, if the visual simulation from either that location or a comparable KOP location indicate that the WTGs would be visible, a finding of adverse effect is appropriate. For example, the simulated view of maximum visibility from KOP 03 Stafford Beach Entrance (Figure I-4) shows that the proposed development of 1,312-foot-tall (400-meter-tall) WTGs located 43.8 miles (70.5 kilometers) away would result in imperceptible changes to the maritime view. Historic properties with historically significant maritime views located in proximity to this KOP are unlikely to experience a visual adverse effect.

By contrast, the simulated view from KOP 32 Fire Island Lighthouse (Figure I-5) located 24.2 miles (39 kilometers) away and taken from an elevated view shows that the proposed offshore wind development with WTGs as short as 853 feet (260 meters) would be clearly visible and would degrade the integrity of the maritime setting and views. Historic properties that rely on a maritime view from an elevated vantage point as part of their NRHP eligibility and that are located in proximity to this KOP are likely to experience a visual adverse effect.

These examples illustrate multiple variables that are involved in the analysis of visual adverse effects and the importance of conducting a careful analysis of project specifics against the unique qualities that qualify each historic property for listing in the NRHP.

KEY OBSERVATION POINT 3 - STAFFORD B (BEACH ENTRANCE)
PROPOSED VIEW - NY BIGHT LEASES (1,312 FT) - MAXIMUM VISIBILITY - 50MM CROP - (WINTER / NOON)

Truescape®

For on-screen display:
Scale bar to be 4 inches wide
Viewing distance 19.7 inches

1/24/2023 at 12:08 - KOP 3

Figure I-4. KOP 03 Stafford Beach entrance

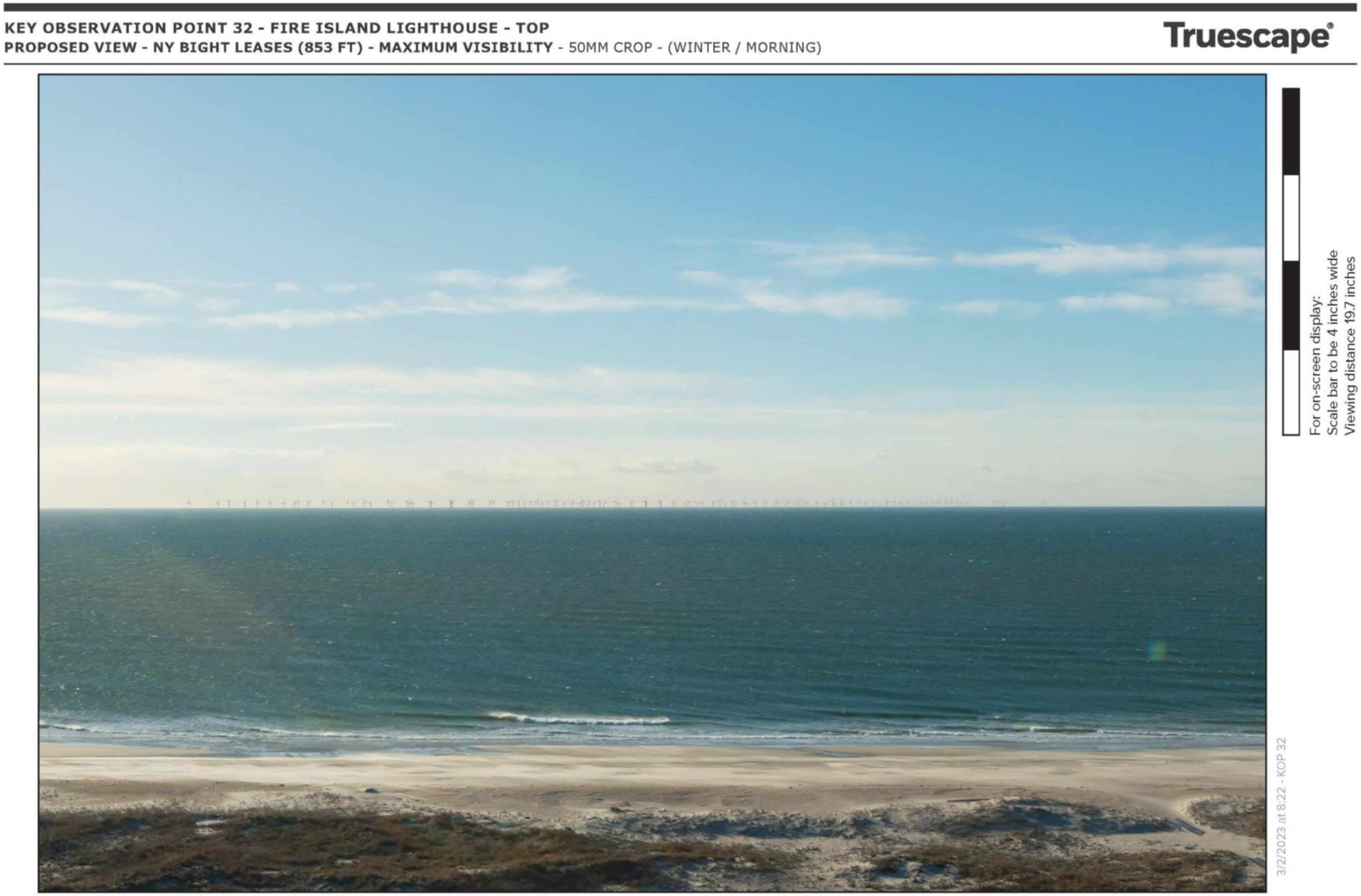

Figure I-5. KOP 32 Fire Island Lighthouse

BOEM does not anticipate that it will be necessary to prepare visual simulations for each of the historic properties located within each project's visual APE. However, it is unlikely that the visual simulations prepared for the PEIS will be sufficient, as project-specific details such as the height and spacing of the WTGs are likely to differ from the RPDE and the 853-foot (260-meter) and 1,312-foot (400-meter) assumptions used as a basis for creating the PEIS simulations. BOEM will review effects recommendations provided in the COP documents to determine sufficiency, and will consult with federally recognized Tribes, New Jersey SHPO, New York SHPO, ACHP, and other consulting parties regarding BOEM's preliminary findings of effect.

I.4 Avoidance, Minimization, Mitigation, and Monitoring Measures

As an outcome of the Section 106 programmatic review of the NY Bight, the Programmatic Agreement for the NY Bight offshore wind activities will include a list of potential resolution measures that can be selected in the event that adverse effects to historic properties are identified during project-level review. One or more potential resolution measures will resolve an adverse effect on a historic property in the event that an adverse effect cannot be avoided. BOEM also encourages lessees to consider relevant RPs as listed in Table 3.6.2-8 of the PEIS during consultation to resolve adverse effects on historic properties.

The types of avoidance measures may include an agreement to completely avoid impacts on known or potential marine cultural resources identified during high-resolution remote sensing surveys. To facilitate complete avoidance of cultural resources may require the relocation of cables or WTGs through micrositing. Avoidance buffer zones will be designated for marine cultural resources (i.e., marine archaeological resources, such as known and potential shipwrecks and associated debris fields; and ASLFs) to ensure that any adverse bottom-disturbing activities do not occur near the cultural resources. In the event the known or potential cultural resource and/or its buffer zones cannot be completely avoided or in the event the cultural resource will be destroyed during construction activities, an archaeological investigation of the resource may be required to further determine appropriate mitigation measures or to completely document the cultural resources prior to the site's disturbance or destruction.

To minimize impacts on marine cultural resources, BOEM may also specify minimization measures that reduce impacts on sites. This may include the use of specific construction techniques, methods, or technologies/equipment that reduce the amount of seafloor impact or adverse effects on a cultural resource.

Implementing a combination of the following measures may avoid visual adverse effects: adjust WTG size, scale, and location to reduce visibility; implement sustainable outdoor lighting prescriptions that reduce impacts on night skies and visibility from coastlines; and place WTGs at distances to where the WTGs are not visible. BOEM will analyze implementation of these measures to determine levels of visual effect during the project specific review stage. If BOEM determines that adverse effects are present, then BOEM will provide recommended specifications that could feasibly meet the threshold of no visual adverse effect.

Potential minimization measures for visual effects include the following: use uniform WTG design, speed, height, and rotor diameter to reduce visual contrast and decrease visual clutter; apply a consistent color to the WTGs prior to commercial operation to reduce visual contrast during daytime hours; use uniform spacing of WTGs to decrease visual clutter; and use an aircraft detection lighting system (ADLS) to limit the time in which WTG lights are on and visible from adversely affected properties.

Based on the type of effect and the historic property adversely affected, possible mitigation measures can include the preparation of documentation in accordance with National Park Service guidance (https://www.nps.gov/subjects/heritagedocumentation/index.htm); historic preservation–related activity that could extend a historic property's existence and use following the Secretary of the Interior's Standards for the Treatment of Historic Properties (https://www.nps.gov/orgs/1739/secretary-standards-treatment-historic-properties.htm); education-related deliverables that enhance the public's understanding of the historic property's original setting and context (e.g., ethnographic research; website highlighting the local community or historic property's history; interpretation of heritage collections; historic preservation planning for that particular historic property or the types of historic properties in a municipality; climate change–related activities that would help extend the use of historic properties that are adversely affected such as a climate change resiliency plan).

BOEM has included measures for avoiding or reducing impacts on historic properties in the PEIS as part of the AMMM measures analyzed in Alternative C (refer to PEIS Section 3.6.2 and Appendix G, *Mitigation and Monitoring,* for a description of these measures). The AMMM measures are consistent with similar measures being developed in the NY Bight Programmatic Agreement for phased identification, post-review discoveries, consideration of potential resolution measures, and preparation of treatment plans when adverse effects cannot be avoided. BOEM has consulted with the Section 106 consulting parties to receive feedback about the anticipated effectiveness of these measures, and to identify any additional measures for inclusion in the Programmatic Agreement and Final PEIS.

I.5 References

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Appendix J: Introduction to Sound and Acoustic Assessment

J.1 Sources of Underwater Sound

Ocean sounds originate from a variety of sources. Some come from non-biological sources such as wind and waves, while others come from the movements or vocalizations of marine life (Hildebrand 2009). In addition, humans introduce sound into the marine environment through activities like oil and gas exploration, construction, military sonars, and vessel traffic (Hildebrand 2009). The acoustic environment or “soundscape” of a given ecosystem comprises all such sounds—biological, non-biological, and anthropogenic (Pijanowski et al. 2011). Soundscapes are highly variable across space, time, and water depth, among other factors, due to the properties of sound transmission and the types of sound sources present in each area. A soundscape is sometimes called the “acoustic habitat,” as it is a vital attribute of a given area where an animal may live (i.e., habitat) (Hatch et al. 2016).

J.2 Physics of Underwater Sound

Sounds are created by the vibration of an object within its medium (Figure J-1). This movement generates kinetic energy (KE), which travels as a propagating wave away from the sound source. As this wave moves through the medium, the particles undergo tiny back-and-forth movements (*particle motion*) along the axis of propagation, but the particles themselves do not travel with the wave. Instead, they oscillate in roughly the same location, transferring their energy to surrounding particles. The vibration is transferred to adjacent particles, which are pushed into areas of high pressure (i.e., compression) and low pressure (i.e., rarefaction). Acoustic pressure is a non-directional (i.e., scalar) quantity, whereas particle motion is an inherently directional quantity (i.e., a vector) taking place in the axis of sound transmission. The total energy of the sound wave includes the potential energy (PE) associated with the sound pressure as well as the KE from particle motion.

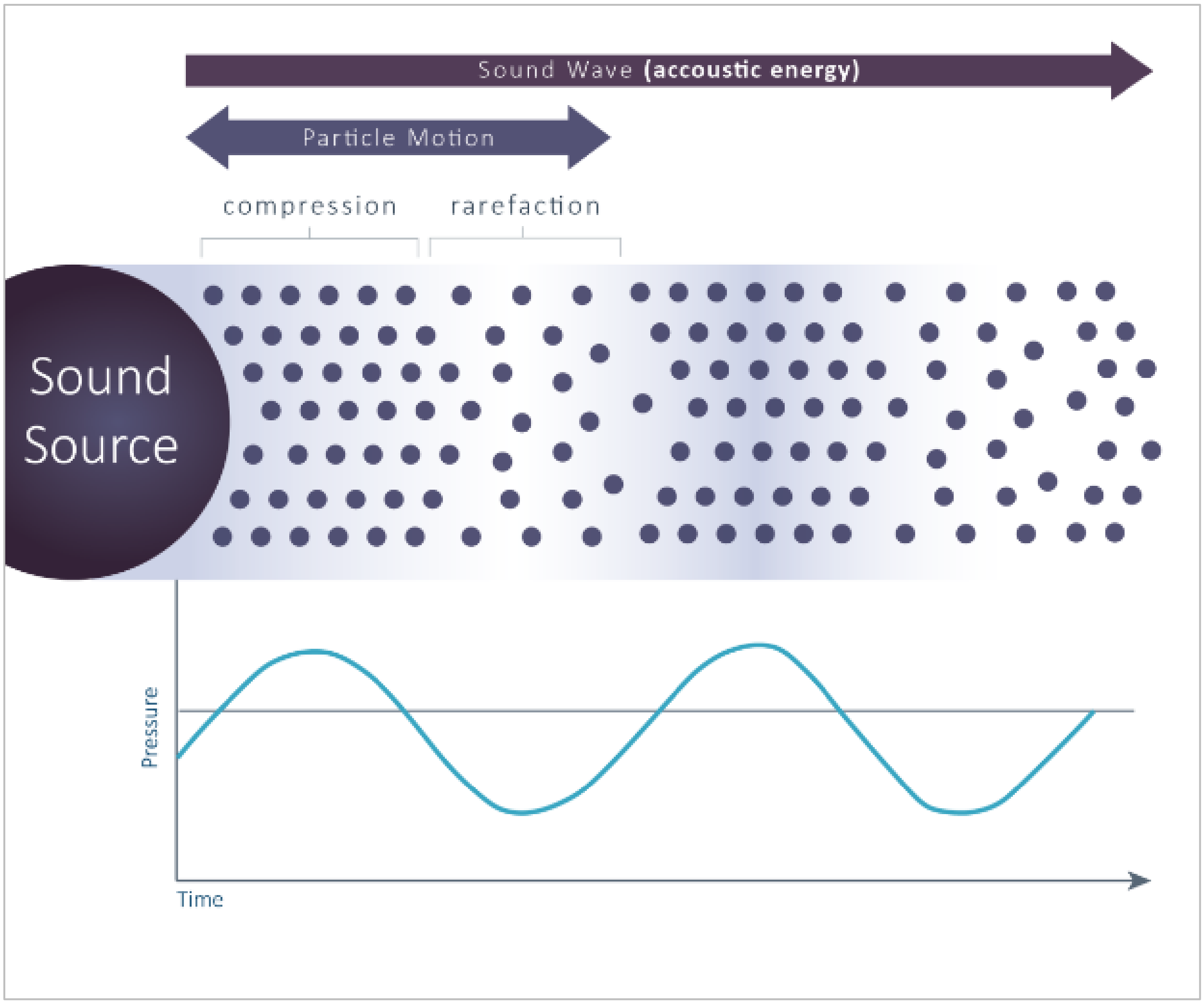

Figure J-1. Basic mechanics of a sound wave

J.2.1 Units of Measurement

Sound can be quantified and characterized based on a number of physical parameters. A complete description of the units can be found in ISO 18405:2017. Some of the major parameters and their International System of Units (SI) units (in parentheses) are as follows.

Acoustic pressure (pascal, Pa): The values used to describe the acoustic (or sound) pressure are peak pressure, peak-to-peak pressure, and root-mean-square (rms) pressure deviation. The peak sound pressure is defined as the maximum absolute sound pressure deviation within a defined time period and is considered an instantaneous value. The peak-to-peak pressure is the range of pressure change from the most negative to the most positive pressure amplitude of a signal (Figure J-2). The rms sound pressure represents a time-averaged pressure and is calculated as the square root of the mean (average) of the time-varying sound pressure over a given period (Figure J-2). The peak level (L_{pk}), peak-to-peak level ($L_{pk\text{-}pk}$), and sound pressure level (L_{rms} or SPL) are computed by multiplying the logarithm of the ratio of the peak or rms pressures to a reference pressure (1 microPascal [µPa] in water) by a factor of 20 and are reported in decibels, see **Sound levels** below.

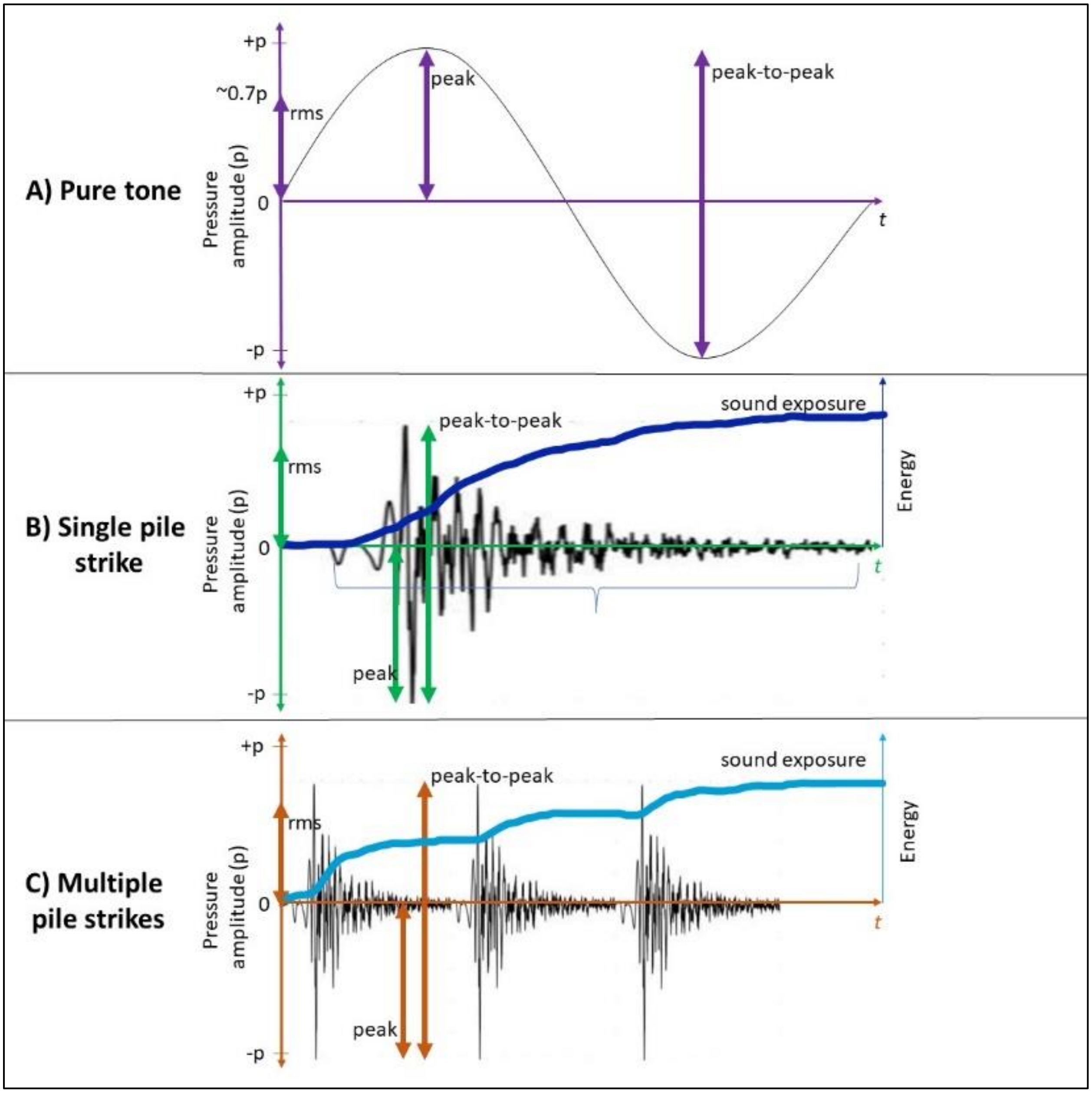

Figure J-2. Sound pressure wave representations of four metrics: root-mean-square (L_{rms}), peak (L_{pk}), peak-to-peak ($L_{pk\text{-}pk}$), and sound exposure level (SEL)

A) A sine wave of a pure tonal signal with equal positive and negative peaks, so peak-to-peak is exactly twice the peak and rms is approximately 0.7 x peak.

B) A single pile-driving strike with one large positive pulse and a large negative pulse that isn't necessarily the same magnitude. In this example, the negative pulse is more extreme so is the reported peak value, and the peak-to-peak is less than double that. Sound exposure is shown as it accumulates across the time window. The final sound exposure would be considered the "single-shot" exposure, and the rms value is that divided by the duration of the pulse.

C) Three consecutive pile-driving strikes with peak and peak-to-peak assessed the same way as in (B). Sound exposure is shown accumulating across all three strikes, and rms is the total sound exposure divided by the entire time window shown. The cumulative sound exposure for this series of signals would be considered the total energy from all three pile-strikes.

Particle velocity (meter per second, m/s): Particle velocity describes the change in position of the oscillating particles about its origin over a unit of time. Similar to sound pressure, particle velocity is dynamic and changes as the particles move back and forth. Therefore, peak particle velocity and root-mean-square particle velocity can be used to describe this physical quantity. One major difference between sound pressure and particle velocity is that the former is a scalar (i.e., without the directional component) and the latter is a vector (i.e., includes both magnitude and direction). Particle acceleration can also be used to describe particle motion, and is defined as the rate of change of velocity of a particle with respect to time. It is measured in units of meters per second squared, or m/s^2.

Sound exposure (pascal-squared second, or Pa^2-s): Sound exposure is proportional to the acoustic energy of a sound. It is the time-integrated squared sound pressure over a stated period or acoustic event (see Figure J-2). Unlike sound pressure, which provides an instantaneous or time-averaged value of acoustic pressure, sound exposure is cumulative over a period of time.

Acoustic intensity (watts per square meter, or W/m^2): Acoustic or sound intensity is the amount of acoustic energy that passes through a unit area normal to the direction of propagation per second. It is the product of the sound pressure and the sound velocity. With an idealized constant source, the pressure and particle velocity will vary in proportion to each other at a given location, but the intensity will remain constant.

Sound levels: There is an extremely wide dynamic range of values when measuring acoustic pressure in pascals, so it is customary to use a logarithmic scale to compress the range of values. Aside from the ease it creates for comparing a wide range of values, animals (including humans) perceive sound on a logarithmic scale. These logarithmic acoustic quantities are known as sound levels and are expressed in decibels (dB), which is the logarithmic ratio of the measurement in question to a fixed reference value. Underwater acoustic sound pressure levels are referenced to a pressure of 1 µPa (equal to 10^{-6} pascals [Pa] or 10^{-11} bar). Note: airborne sound pressure levels have a different reference pressure: 20 µPa.

The metrics previously described (sound pressure, sound exposure, and acoustic intensity) can also be expressed as levels, and are commonly used in this way:

- Root-mean-square sound pressure level (L_{rms} or SPL, units of dB re 1 µPa)
- Peak pressure level (L_{pk}, units of dB re 1 µPa)
- Peak-to-peak pressure level (L_{pk-pk}, units of dB re 1 µPa)
- Sound exposure level (SEL, units of dB re 1 $\mu Pa^2 s$)

Note: A few commonly used time periods are used for SEL, including a 24-hour period (used in the United States for the regulation of noise impacts on marine mammals (SEL_{24}), or the duration of a single event, such as a single pile-driving strike or an air gun pulse, called the single strike SEL (SEL_{ss}). A sound exposure for some other period of time, such as the entire installation of a pile, may be written without a subscript (SEL), but in order to be meaningful, should always denote the duration of the event.

Source level: Another commonly discussed concept is source level. Source level is a representation of the amount of acoustic power radiated from the sound source being described. It describes how loud a particular source is in a way that can inform expected received levels at various ranges. It can be conceptualized as the product of the pressure at a particular location and the range from that location to a spherical (omnidirectional) source in an idealized infinite lossless medium. The source level is the sum of the received level and the propagation loss to that receiver. It is often discussed as what the received level would be 1 meter (m) from the source, but this can lead to confusion as an actual measurement at 1 m is likely to be impossible for large or non-spherical sources. The most common type is an SPL source level in units of dB re 1 µPa-m, though in some circumstances a SEL source level (in dB re 1 $\mu Pa^2 s\text{-}m^2$) may be expressed; peak source level (in units of dB re 1 µPa-m) may also be appropriate for some sources.

J.2.2 Propagation of Sound in the Ocean

Underwater sound can be described through a source-path-receiver model. An acoustic source emits sound energy that radiates outward and travels through the water and the seafloor. The sound level decreases with increasing distance from the acoustic source as the sound travels through the environment. The amount by which the sound levels decrease between the theoretical source level and a receiver is called *propagation loss.* Among other things, the amount of propagation loss that occurs depends on the source-receiver separation, the geometry of the environment the sound is propagating through, the frequency of the sound, the properties of the water column, and the properties of the seafloor and sea surface.

When sound waves travel through the ocean, they may encounter areas with different physical properties that will likely alter the propagation pathway of the sound, compared to a homogenous and boundaryless environment. For example, near the ocean's surface, water temperature is usually higher, resulting in relatively fast sound speeds. As temperature decreases with increasing depth, the sound speed decreases. Sounds bend toward areas with lower speeds (Urick 1983). Ocean sound speeds are often slowest at mid-latitude depths of about 1,000 m, and because of sound's preference for lower speeds, sound waves above and below this "deep sound channel" often bend towards it. Sounds originating in this layer can travel great distances. Sounds can also be trapped in the mixed layer near the ocean's surface (Urick 1983). Latitude, weather, and local circulation patterns influence the depth of the mixed layer, and the propagation of sounds near the surface is highly variable and difficult to predict.

At the boundaries near the sea surface and the sea floor, acoustic energy can be scattered, reflected, or attenuated depending on the properties at the surface (e.g., roughness, presence of wave activity, or bubbles) or seafloor (e.g., bathymetric features, substrate heterogeneity). For example, fine-grain sediments tend to absorb sounds well, while hard bottom substrates reflect much of the acoustic energy back into the water column. The presence of ice on the ocean's surface can also affect sound propagation. For example, the presence of solid ice may dampen sound levels by blocking surface winds. The presence of ice can also increase sound levels when pieces of ice break or scrape together (Urick 1983). The effect will also depend on the thickness and roughness of the ice, among many other factors related to the ambient conditions. As a sound wave moves from a source to a receiver (i.e., an animal), it may travel on multiple pathways that may be direct, reflected, refracted, or a combination of these mechanisms, creating a complex pattern of transmission across range and depth. The patterns may become even more complicated in shallow waters due to repeated interactions with the surface and the bottom, frequency-specific propagation, and more heterogenous seafloor properties. All of these variables contribute to the difficulty in reliably predicting the sound field in a given marine environment at any particular time.

J.2.3 Sound Source Classification

In the current regulatory context, anthropogenic sound sources are divided into four types: impulsive, non-impulsive, continuous, and intermittent, based on their differing potential to affect marine species (National Marine Fisheries Service [NMFS] 2018). Specifically, when it comes to potential damage to marine mammal hearing, sounds are classified as either impulsive or non-impulsive, and when considering the potential to affect behavior or acoustic masking, sounds are classified as either continuous or intermittent.

Impulsive noises are characterized as having (ANSI S1.13-2005):

- Broadband frequency content
- Fast rise-times and rapid decay times
- Short durations (i.e., <1 s)
- High peak sound pressures

Whereas the characteristics of non-impulsive sound sources are less clear but may be:

- Variable in spectral composition (i.e., broadband, narrowband, or tonal)
- Longer rise-time/decay times, and total durations compared to an impulsive sound
- Continuous (e.g., vessel engine radiated noise), or intermittent (e.g., echosounder pulses).

Impulsive sounds associated with offshore wind development include explosions, sparkers, boomers, and impact pile-driving; it is generally accepted that impulsive sources have a greater likelihood of causing hearing damage than non-impulsive sources (note: explosions are further considered for non-auditory injury; see Thresholds for Non-Auditory Injury in Programmatic Environmental Impact Statement [PEIS] Section 3.5.6.1.3). At close distances to impulsive sounds, physiological effects on an animal are likely, including temporary threshold shift and permanent threshold shift, although these effects are also possible after exposure to non-impulsive sounds if the duration of exposure is long enough. This binary, at-the-source classification of sound types, therefore, provides a conservative framework upon which to predict potential adverse hearing impacts on marine mammals.

For behavioral effects of anthropogenic sound on marine mammals, NMFS classifies sound sources as either intermittent or continuous (NMFS 2018). Continuous sounds, such as drilling or vibratory pile-driving, remain “on,” i.e., above ambient noise, for a given period of time, though this is not well-defined. An intermittent sound typically consists of bursts or pulses of sound on a regular on-off pattern, also called the duty-cycle. Examples of intermittent sounds are those from scientific echosounders, sub-bottom profilers, and even pile-driving. It is important to recognize that these delineations are not always practical in application, as a continuous yet moving sound source (such as a vessel passing over a fixed receiver) could be considered intermittent from the perspective of the receiver.

In reality, animals will encounter many signals in their environment that may contain many or all of these sound types, called complex sounds. And even for sounds that are impulsive at the source, as the signal propagates through the water, the degree of impulsiveness decreases (Martin et al. 2020). While there is evidence, at least in terrestrial mammals (Hamernik and Hsueh 1991), that complex sounds can be more damaging than continuous sounds, there is not currently a regulatory category for this type of sound. One current approach for assessing the impulsiveness of a sound that has gained attention is to compute the *kurtosis* of that signal. Kurtosis is a statistical measure that describes the prevalence of extreme values within a distribution of observations, in other words the “spikiness” of the data. By definition, a sound with a kurtosis value of 3 or less has very few extreme values and is generally considered *Gaussian* (i.e., normally distributed) noise. Martin et al. (2020) showed that a kurtosis value greater than 40 represents a distribution of observations with many extreme values and is very spiky. This generally describes an impulsive noise. A distribution of sound level observations from a time series with a kurtosis value somewhere in between these two values would be considered a complex sound.

J.3 Sound Sources Related to Offshore Wind Development

J.3.1 Geophysical and Geotechnical Surveys

Geophysical and geotechnical surveys are conducted to characterize the bathymetry, sediment type, and benthic habitat characteristics of the marine environment. They may also be used to identify archaeological resources or obstacles on the seafloor. These types of surveys occur in the site assessment phase in order to inform the placement of offshore wind foundations but may also occur intermittently during and after turbine construction to identify, guide, and confirm the locations of turbine foundations. The suite of high-resolution geophysical (HRG) sources that may be used in geophysical surveys includes side-scan sonars (SSS), multibeam echosounders (MBES), magnetometers and gradiometers, parametric sub-bottom profilers, compressed high-intensity radiated pulses (CHIRP) sub-bottom profilers, boomers, and sparkers. Seismic airguns are not expected to be used for offshore wind applications. These HRG sources may be towed behind a ship, mounted on a ship’s hull, or deployed from remotely operated vehicles (ROVs) or autonomous underwater vehicles (AUVs).

Many HRG sources are active acoustic sources, meaning they produce sound deliberately in order to obtain information about the environment. With the exception of some MBES and SSS, they produce sounds below 180 kilohertz (kHz) and thus may be audible to marine species. Source levels vary widely depending on source type and operational power level used, from ~145 dB re 1 μPa-m for towed sub-bottom profilers up to 245 dB re 1 μPa-m for some multibeam echosounders (Crocker and Fratantonio 2016). Generally speaking, sources that emit sound in narrow beams directed at the seafloor are less likely to affect marine species because they ensonify a smaller portion of the water column, thus reducing the likelihood that an animal encounters the sound (Ruppel et al. 2022). While sparkers are omnidirectional, most other HRG sources have narrower beamwidths (e.g., MBES: up to 6°, parametric SBPs: 30°, boomers: 30–90°) (Crocker and Fratantonio 2016). Most HRG sources emit short pulses of sound, with periods of silence in between. This means that only several "pings" emitted from a vessel towing an active acoustic source would reach an animal below, even if the animal was stationary (Ruppel et al. 2022). HRG surveys may occur throughout the construction area with the potential for greater effort in some areas.

Geotechnical surveys may use vibracores, jet probes, bottom-grab samplers, deep borings, or other methods to obtain samples of sediments at each potential turbine location and along the cable route. For most of these methods, source levels have not been measured, but it is generally assumed that low-frequency, low-level noise will be introduced as a byproduct of these actions. It is likely that the sound of the vessel will exceed that generated by the geotechnical method itself.

The potential impacts of geophysical and geotechnical surveys during construction activities on marine mammals and sea turtles are analyzed in Chapter 3, *Affected Environment and Environmental Consequences,* of the PEIS.

J.3.2 Unexploded Ordnance Detonations

Unexploded Ordnances (UXOs) may be discovered on the seabed in offshore wind lease areas or along export cable routes. While non-explosive methods may be employed to lift and move these objects, some may need to be detonated. Underwater explosions of this type create a shock wave with a nearly instantaneous rise in pressure, followed by a series of symmetrical bubble pulses. Shock waves are supersonic, so they travel faster than the speed of sound. The explosive sound field is extremely complex, especially in shallow waters. In 2015, von Benda-Beckmann et al. measured received levels of explosions in shallow waters at distances ranging from 100 to 2,000 m from the source, in water depths ranging from 6 to 22 m. The measured SEL from the explosive removal of a 263 kilogram (kg) charge was 216 dB re 1 $\mu Pa^2 s$ at a distance of 100 m and 196 dB re 1 $\mu Pa^2 s$ at 2,000 m. They found that SELs were lower near the surface than near the seafloor or in the middle of the water column, suggesting that if an animal is near the surface, the effects may be less damaging. Most of the acoustic energy for underwater explosions is below 1,000 hertz (Hz). The potential impacts of UXO detonations on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

As an alternative to traditional detonation, a newer method called deflagration allows for the controlled burning of underwater ammunition. Typically, an ROV uses a small, targeted charge to initiate rapid burning of the ordnance; once this process is complete, the remaining debris can be cleared away. Recent work has demonstrated that both L_{pk} and SEL measured from deflagration events may be as much as 20 dB lower than equivalently sized high-order detonations (Robinson et al. 2020).

J.3.3 Construction and Installation

J.3.3.1 Impact and Vibratory Pile-Driving

At present, the installation of turbine foundations is largely done using pile-driving. There are several techniques, including impact and vibratory driving, and many pile designs and sizes, including monopile and jacket foundations. Impact pile-driving employs a hammer to strike the pile head and force the pile into the sediment with a typical hammer strike rate of approximately 30 to 50 strikes/minute (sm). Typically, force is applied over a period of less than 20 sm, but the pile can generate sound for upwards of 0.5 s. Impact pile-driving noise is characterized as impulsive because of its high peak pressure, short duration, and rapid onset time. Underwater sound levels generated during pile-driving depend on many factors including the pile material and size, characteristics of the substrate, penetration of the pile in the seabed, hammer energy and size, and water depth. Currently the design envelope for most offshore wind turbine installations anticipates hammer energy between 2,500 and 4,000 kilojoules (kJs), but generally speaking, with increasing pile diameter, greater hammer energy is used. The propagation of pile-driving sounds depends on factors such as the sound speed in the water column (influenced by temperature, salinity, and depth), the bathymetry, and the composition of sediments in the seabed, and will therefore vary among sites. Due to variation in these features, sounds may not radiate symmetrically outward from a pile.

Thus far, there are only a few measurements from construction of offshore wind turbines in United States waters. Two monopiles (7.8-m diameter) were installed off the coast of Virginia (27-m water depth) in 2020. Dominion Energy (2020) recorded sounds during this process; without noise mitigation, L_{pk} source levels were back-calculated to be 221 dB re 1 µPa-m, but with a double bubble curtain, L_{pk} source levels were around 212 dB re 1 µPa-m. The unmitigated SPL source level was 213 dB re 1 µPa-m; the mitigated SPL source level was 204 dB re 1 µPa-m.

Jacket foundations are also common, if not for the main turbine structures, for other structures associated with the wind farm such as the offshore substations (OSSs). Jacket foundations are installed using pin piles, which are generally significantly smaller than monopiles, on the order of 2 to 5 m in diameter, but more pin piles are needed per foundation. The sound levels generated will vary depending on the pile material, size, substrate, hammer energy, and water depth.

At the Block Island Wind Farm (BIWF), Amaral et al. (2018a) measured sound levels at various distances during pile-driving of jacket foundations (50 -inch pile diameter, 30-m water depth). It should be noted that the piles were installed at an angle (from vertical), which influenced the directionality of the noise produced, so caution is encouraged with interpretation. Nonetheless, the authors reported SPL received levels between 150 and 160 dB re 1 µPa at approximately 750 m from the piles. The maximum single strike SEL measured at 750 m from the jacket foundations at BIWF ranged from 160–168 dB re 1 µPa^{2}s, nearly 10 dB lower than at Coastal Virginia Offshore Wind (CVOW) (OCS-A 0497). Using measurements combined with acoustic modeling, the peak-peak source levels for pile-driving at BIWF were estimated to be between 233 and 245 dB re 1 µPa-m (Amaral et al. 2018b).

The potential impacts of impact pile-driving on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

Vibratory hammers may be used as an alternative to impact pile-driving. The vibratory hammer continuously exerts vertical vibrations into the pile, which causes the sediment surrounding the pile to liquefy, allowing the pile to penetrate the substrate. The vibratory hammer typically oscillates at a frequency of 20 to 40 Hz (Matuschek and Betke 2009) and produces most of its acoustic energy below 2 kHz. Buehler et al. (2015) measured sound levels at 10-m distance from a 72-inch steel pile, and found them to be 185 dB re 1 µPa, but this is significantly smaller than the sizes expected for offshore wind. While no measurements of vibratory piling for large monopiles have been conducted, modeling predictions from South Coast Wind (OCS-A 0521), for example, estimate that SPL received levels could exceed the behavioral harassment threshold for marine mammals (120 dB re 1 µPa) at distances > 40 kilometers (km) for a 16-m-diameter monopile (LGL Ecological Research Associates 2022). Vibratory pile-driving is a non-impulsive sound source and the hammer produces sound continuously, so different criteria are used for assessing behavioral and physiological effects on marine mammals.

The potential impacts of vibratory pile-driving on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

A technique that is quickly gaining use for installation in hard rock substrates is down-the-hole (DTH) pile-driving, which uses a combination of percussive and drilling mechanisms, with a hammer acting directly on the rock to advance a hole into the rock, and also advance the pile into that hole (Guan et al. 2022). Noise characteristics for DTH pile-driving include both impulsive and non-impulsive components. The impulsive component of DTH pile-driving is the result of a percussive hammer striking the bedrock, while the non-impulsive component is from drilling and air-lifting of cuttings and debris from the pile. While only limited studies have been conducted on DTH pile-driving noise, its characteristics strongly resemble those of impact pile-driving, but with a higher hammer striking rate (approximately 10 to 15 Hz). The dominant frequencies from DTH pile-driving are below 2 kHz, similar to conventional impact pile-driving. Due to the high rate of hammer striking, along with the sounds of drilling and debris clearing out, sound levels in between the pulses are much higher than conventional impact pile-driving (Guan et al. 2022).

Various noise abatement technologies, such as bubble curtains, arrays of enclosed air resonators, or segmented nets of rubber or foam, may be employed to reduce noise from impact pile-driving. Measurements from European wind farms have shown that a single noise abatement system can reduce broadband sound levels by 10–15 dB, while using two systems together can reduce sound levels as much as 20 dB (Bellmann et al. 2020). Based on RODEO measurements from CVOW (OCS-A 0497), double Big Bubble Curtains (dBBC) are shown to be most effective for frequencies above 200 Hz, and greater noise reduction was seen in measurements taken in the middle of the water column compared to those near the seabed. Approximate sound level reduction is 3 to 5 dB below 200 Hz, and 8 to 20 dB above 200 Hz, depending on the characteristics of the bubble curtain (Amaral et al. 2020).

J.3.4 Drilling

Drilling associated with offshore wind activities may involve geotechnical surveys, HDD at the export cable landfalls, and, if necessary, removing large boulders at the site of foundation installation. Sounds from drilling are generally considered to be non-impulsive and are nearly continuous in nature, though they may be highly variable depending on the type of substrate that is encountered (Richardson et al. 1995). There could be tonal sound generated by the drill bit, mechanical noise transferred through the ship's hull, and noise from the vessels and dynamic positioning systems. HDD uses equipment that is generally located on shore, and the sound that propagates into the water is expected to be negligible. Geotechnical drilling SPLs (in the 30–2000 Hz band) have been measured up to 145 dB re 1 µPa-m from a jack-up platform (Erbe and McPherson 2017), and up to 162 dB re 1 µPa-m from an anchored drilling vessel (Huang et al. 2023). If drilling is required for foundation installation, a large drill bit at the bottom of the pile would slowly rotate to break up the material inside the pile, and the liquefied material would be pumped out. While measurements of these operations specifically for offshore wind installation have not been conducted, the closest proxy is from oil and gas-related operations, where a 6-m-diameter drill bit was used for the excavation of mudline cellars (Austin et al. 2018). Austin et al. (2018) measured received levels at 1,000 m from the operations and back-calculated the SPL source levels to be between 191 and 193 dB re 1 µPa-m.

J.3.4.1 Vessels

During construction, vessels and aircraft may be used to transport crew and equipment. See Section J.3.5, *Operations and Maintenance,* for further detail about sounds related to those activities. Large vessels will also be used during the construction phase to conduct pile-driving, and may use Dynamic Positioning (DP) systems. DP is the process by which a vessel holds station over a specific seafloor location for some time period using input from gyrocompasses, motion sensors, Global Positioning Systems (GPS), active acoustic positioning systems, and wind sensors to determine relative movement and environmental forces at work. Generally speaking, most acoustic energy is <1,000 Hz, often below 50 Hz, with tones related to engine and propeller size and type. The sound can also vary directionally, and this directionality is much more pronounced at higher frequencies. Because this is a dynamic operation, the sound levels produced will vary based on the specific operation, DP system used (e.g., jet or propeller rotation, versus a rudder or steering mechanism), and factors such as the blade rate and cavitation, in some cases. Representative sound field measurements from the use of DP are difficult to obtain because the sound transmitted is often highly directional and context specific. The direction of sound propagation may change as different DP needs requiring different configurations are applied.

Many studies have found that the measured sound levels of DP alone are, counterintuitively, higher than those of DP combined with the intended activities such as drilling (Jiménez-Arranz et al. 2020; Kyhn et al. 2011; Nedwell and Edwards 2004) and coring (Warner and McCrodan 2011). Nedwell and Edwards (2004) reported that DP thrusters of the semi-submersible drill rig *Jack Bates* produced periodic noise (corresponding to the rate of the thruster blades) with most energy between 3 and 30 Hz. The received SPL measured at 100 m from the vessel was 188 dB re 1 µPa. Warner (2011) found that most DP-related sounds from the self-propelled drill ship, R/V *Fugro Synergy* were in the 110 to 140 Hz range, with an estimated source level of 169 dB re 1 µPa-m. Sounds in this frequency range varied by 12 dB during DP, while the broadband levels, which also included diesel generators and other equipment sounds, varied by only 5 dB over the same time period. All of the above sources report high variability in levels with time. This is due in part to the intermittent usage and relatively slow rotation rates of thrusters used in DP. It is also difficult to provide a realistic range of source levels from the data thus far because most reports do not identify the direction from which sound was measured relative to the vessel, and DP thrusters are highly directional systems.

The active acoustic positioning systems used in DP can be additional sources of high frequency sound. These systems usually consist of a transducer mounted through the vessel's hull and one or more transponders affixed to the seabed. The Kongsberg High Precision Acoustic Positioning (HiPAP) system produces pings in the 10 to 32 kHz frequency range. The hull-mounted transducers have source levels of 188 to 206 dB re 1 µPa-m depending on adjustable power settings (Kongsberg Maritime AS 2013). The fixed transponders have maximum source levels of 186 to 206 dB re 1 µPa-m depending on model and beam width settings from 15 to 90° (Jiminez-Arranz et al. 2020). These systems have high source levels, but beyond 2 km, they are generally quieter than other sound components from DP vessels for various reasons including: their pulses are produced in narrowly directed beams, each individual pulse is very short, and their high frequency content leads to faster attenuation. The potential impacts of vessel noise on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

J.3.4.2 Site Preparation

Prior to offshore wind project foundation and export cable installation, boulder clearance and pre-lay grapnel runs may be conducted to clear the area of obstructions. This may involve the use of a displacement plow, a subsea grab or, in shallower waters, a backhoe dredger. Sandwave clearance may also be conducted in advance of export cable installation to remove mobile sediments using a suction hopper dredger, controlled flow excavation, or plow. At landfall locations, export cables may be installed using HDD, which may require mechanical dredging of the HDD exit pit.

Sounds from site preparation activities are considered non-impulsive and are nearly continuous in nature. Dredging produces distinct sounds during each specific phase of operation: excavation, transport, and placement of dredged material (Central Dredging Association 2011; Jiminez-Arranz et al. 2020). Engines, pumps, and support vessels used throughout all phases may introduce low-level, continuous noise into the marine environment. The sounds produced during excavation vary depending on the sediment type—the denser and more consolidated the sediment is, the more force the dredger needs to impart, and the higher sound levels that are produced (Robinson et al. 2011a). Sounds from mechanical dredges occur in intervals as the dredge lowers a bucket, digs, and raises the bucket with a winch. During the sediment transport phase, many factors—including the load capacity, draft, and speed of the vessel—influence the sound levels that are produced (Reine et al. 2014). SPL source levels during backhoe dredge operations range from 163 to 179 dB re 1 µPa-m (Nedwell et al. 2008; Reine et al. 2012). As a whole, dredging activities generally produce low-frequency sounds, with most energy below 1,000 Hz and frequency peaks typically occurring between 150 and 300 Hz (McQueen et al. 2018). Additional detail and measurements of dredging sounds can be found in Jiminez-Arranz et al. (2020), McQueen et al. (2018), and Robinson et al. (2011a).

The potential impacts of site preparation activities on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

J.3.4.3 Trenching and Cable-Laying

The installation of cables can be done by towing a tool behind the installation vessel to simultaneously open the seabed and lay the cable, or by laying the cable and following with a tool to embed the cable. Possible installation methods for these options include jetting, vertical injection, control flow excavation, trenching, and plowing. Burial depth of the cables is typically 1–2 m. Cable installation vessels may utilize dynamic positioning to lay the cables, which can introduce considerable levels of noise into the marine environment (see Section J.3.4.1, *Vessels*).

Nedwell and Edwards (2004) measured sounds from a 130-m-long trenching vessel and found that sound levels were similar to those produced during pipeline-laying in the same area, with the exception of a 20 kHz tonal sound, which they attributed to the vessel's DP thrusters. Nedwell et al. (2003) recorded underwater sound 160 m away from trenching activity (water depth 7–11 m) and back-calculated the SPL source level of trenching to be 178 dB re 1 µPa-m (assuming propagation loss of 22logR). They described the sound as generally spanning a wide range of frequencies, variable over time, and accompanied by some tonal machinery noise and transient noises associated with rock breakage.

Johansson and Andersson (2012) recorded underwater noise levels during both pipelaying and trenching. The mean SPL measured (at 1,500 m from the pipeline) during pipelay operations was 130.5 dB re 1 µPa, nearly 20 dB higher than average background noise at the same location. There were eight support vessels in the vicinity during pipelaying operations. During trenching, with only one vessel in the vicinity, received levels were 126 dB re 1 µPa, and the authors back-calculated the SPL source level to be 183.5 dB re 1 µPa, similar to that of commercial vessels in the region.

J.3.5 Operations and Maintenance

J.3.5.1 Aircraft

Staffed aircraft consist of propeller and jet engines, fixed-wing craft, as well as helicopters. Unmanned systems also exist. For jet engine aircraft, the engine is the primary source of sound. For propeller driven aircraft and helicopters, the propellers and rotors also produce noise. Aircraft generally produce low-frequency sound below 500 Hz (Richardson et al. 1995). While aircraft noise can be substantial in air, penetration of aircraft noise into the water is limited because much of the noise is reflected off the water's surface (Richardson et al. 1995). The noise that penetrates into the water column does this via a critical incident angle or cone. With an idealized flat sea surface, the maximum critical incident angle is

~13 degrees (Urick 1983); beyond this, sound is reflected off the surface. When the sea surface is not flat, there may be some additional penetration into the water column in areas outside of this 13-degree cone. Nonetheless, the extent of noise from passing aircraft is more localized in water than it is in air.

Jiménez-Arranz et al. (2020) reviewed Richardson et al.'s (1995) sound measurements recorded below passing aircraft of various models. These SPL measurements included 124 dB re 1 µPa (dominant frequencies between 56 and 80 Hz) from a maritime patrol aircraft with an altitude of 76 m, 109 dB re 1 µPa (dominant frequency content below 22 Hz) from a utility helicopter with an altitude of 152 m, and 107 dB re 1 µPa (tonal, 82 Hz) from a turbo propeller with an altitude of 457 m. Recent published levels associated with unmanned aircraft (Christiansen et al. 2016; Erbe et al. 2017) indicate source levels around or below 100 dB re 1 µPa-m. The potential impacts of aircraft noise on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

J.3.5.2 Vessels in Transit

During operations, small vessels may be used to transport crew and supplies. Noise from vessel transit is considered to be continuous, with a combination of broadband and tonal sounds (Richardson et al. 1995; Ross 1976). Transiting vessels generate continuous sound from their engines, propeller cavitation, onboard machinery, and hydrodynamics of water flows (Ross 1976). The actual radiated sound depends on several factors, including the type of machinery on the ship, the material conditions of the hull, how recently the hull has been cleaned, interactions with the sea surface, and shielding from the hull, which reduces sound levels in front of the ship.

In general, vessel noise increases with ship size, power, speed, propeller blade size, number of blades, and rotations per minute. Source levels for large container ships can range from 177 to 188 dB re 1 µPa-m (McKenna et al. 2013) with most energy below 1 kHz. This low-frequency noise can travel extremely far distances and has been shown to be detectable at 125 km from the source (Aulanier et al. 2017). Smaller vessels typically produce higher-frequency sound concentrated in the 1 to 5 kHz range. Kipple and Gabriele (2003) measured underwater sound from vessels ranging from 14 to 65 feet long (25 to 420 horsepower) and back-calculated source levels to be 157 to 181 dB re 1 µPa-m. Similar levels are reported by Jiménez-Arranz et al. (2020), who provide a review of measurements for support and crew vessels, tugs, rigid hull inflatable boats, icebreakers, cargo ships, oil tankers, and more.

During transit to and from shore bases, survey vessels typically travel at speeds that optimize efficiency, except in areas where transit speed is restricted. The vessel strike speed restrictions that are in place along the Atlantic Outer Continental Shelf (OCS) are expected to offer a secondary benefit of underwater noise reduction. For example, recordings from a speed reduction program in the Port of Vancouver (210- to 250-m water depths) showed that reducing speeds to 11 knots reduced vessel source levels by 5.9 to 11.5 dB, depending on the vessel type (MacGillivray et al. 2019). Furthermore, Findlay et al. (2023) documented how small reductions in cargo vessel speed in the Port of Vancouver can substantially reduce noise impacts on marine mammals. Vessel noise is also expected to be lower during geophysical and geotechnical surveys, as they typically travel around 5 knots when towing instruments. The potential impacts of vessel noise on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

J.3.5.3 Turbine Operations

Once wind farms are operational, low-level sounds are generated by each wind turbine generator (WTG), but sound levels are much lower than during construction. This type of sound is considered to be continuous, omnidirectional radially from the pile, and non-impulsive. Most of the energy associated with operations is below 120 Hz. Sound levels from wind turbine operations are likely to increase somewhat with increasing generator size and power ratings, as well as with wind speeds. Recordings from BIWF indicated that there was a correlation between underwater sound levels and increasing wind speed, but this was not clearly influenced by turbine machinery; rather it may have been explained by the natural effects that wind and sea state have on underwater sound levels (Elliott et al. 2019; Urick 1983).

A recent compilation (Tougaard et al. 2020) of operational noise from several wind farms, with turbines up to 6.15 megawatts (MW) in size, showed that operational noise generally attenuates rapidly with distance from the turbines, falling to near ambient sound levels within ~1 km from the source; the combined noise levels from multiple turbines is lower or comparable to that generated by a small cargo ship. Tougaard et al. (2020) developed a formula predicting a 13.6 dB increase for every 10-fold increase in WTG power rating. This means that operational noise could be expected to increase by 13.6 dB when increasing in size from a 0.5 MW turbine to a 5 MW one, or from 1 MW to 10 MW. The least squares fit of that dataset would predict that the SPL measured 100 m from a hypothetical 15 MW turbine in operation in 10 m/s (19 kilotons [kt] or 22 miles per hour [mph]) wind would be 125 dB re 1 µPa. However, all 46 data points in Tougaard et al. (2020), with the exception of the two from BIWF, were from WTGs operated with gear boxes of various designs rather than the newer use of direct-drive motor technology, which is expected to generate less underwater noise (Stöber and Thomsen 2021; Betke and Bellmann 2023). An additional compilation by Stöber and Thomsen (2021) made predictions for source levels of 10 MW turbines based on a linear extrapolation of maximum received levels from WTGs with ratings up to 6.15 MW. The linear fit is likely inappropriate, and the resulting predictions may be exaggerated. A recent study by Holme et al. (2023) indicated that the Tougaard et al. (2020) equations may overestimate underwater sound levels generated by operating WTGs, particularly at short distances from the foundation, suggesting that SPLs may drop below the behavioral threshold at shorter distances than predicted. Holme et al. (2023) examined underwater noise measurements recorded within and outside operating offshore wind farms consisting of 6.3 MW (with direct-drive motors) and 8.3 MW (with planetary gear box) turbines, respectively. The results imply that there is no significant relationship between the broadband underwater noise levels and turbine activity for any of the examined wind farms in the monitored distances (up to 70 m) (Holme et al. 2023). An additional study by Betke and Bellmann (2023) examined turbines up to 8 MW and did not find an upward trend in underwater noise with rated power (a proxy for turbine size), whereas both Tougaard et al. (2020) and Stöber and Thomsen (2021) included piles up to 6 MW and found a statistically significant relationship. Bellmann et al. (2023) suggest that the modeling approaches by Tougaard et al. (2020) and Stöber and Thomsen

(2021) for operational noise are primarily based on a few types of smaller turbine types (often with gear boxes), so that predictions of the noise conditions of existing offshore windfarms of the latest generation (e.g., Holme et al. 2023) lead to overestimations of the measured operational noise of turbines of up to 8 dB.

Underwater noise has been characterized in two locations in Scotland using a five-turbine array of 9.5-MW semi-submersible foundations with gear boxes in Kincardine, and 6-MW floating spar buoys with direct drive motors located in "Hywind Scotland" (Risch et al. 2023). Source levels for turbine operational noise (25 Hz–20 kHz) increased with wind speed at both recording locations. At a wind speed of 15 m/s, operational noise levels were found to be about 3 dB higher at Kincardine (148.8 dB re 1 µPa) as compared to Hywind Scotland (145.4 dB re 1 µPa), which might be a function of the different power ratings, gear box vs. direct drive technology, or the difference in mooring structure of the two turbines (i.e., semi-submersible vs. spar-buoy). Assuming 15 m/s wind speed, predicted noise fields for unweighted SPLs were above median ambient noise levels in the North Sea for maximum distances of 3.5–4.0 km from the centroid of the Kincardine five-turbine array, and 3.0–3.7 km for the five-turbine array at Hywind Scotland (Risch et al. 2023).

Tougaard et al. (2020) point out that received level differences among different pile types could be confounded by differences in water depth and turbine size. In any case, additional data is needed to fully understand the effects of size, foundation type properties (e.g., structural rigidity and strength), and drive type on the amount of sound produced during turbine operation. The potential impacts of operational turbine noise on marine mammals and sea turtles are analyzed in PEIS Chapter 3.

J.3.6 Decommissioning

The methods that may be used for decommissioning are not well understood at this time. It is possible that explosives may be used (see Section J.3.2, *Unexploded Ordnance Detonations*). However, given the general trend of reducing the use of underwater explosives that has been observed in the oil and gas industry, it is likely that offshore wind structures will instead be removed by cutting. While it is difficult to extrapolate directly, some insights can be gleaned from a recent study that measured received sound levels during the mechanical cutting of well conductor casings on oil and gas platforms in California. The cutters operated at 60 to 72 revolutions per minute (RPM), and the cutting time varied widely between cuts (on the order of minutes to hours). At distances of 106 to 117 m from the cutting, received SPLs were 120 to 130 dB re 1 µPa, with most acoustic energy falling between 20 and 2000 Hz (Fowler et al. 2022). This type of sound is considered to be non-impulsive and intermittent (i.e., continuous while cuts are actually being made, with quieter periods between cuts). Additional noise from vessels (see Section J.3.4.1, *Vessels*) and other machinery may also be introduced throughout the decommissioning process.

J.3.7 Non-pile-driving Foundations and Noise Abatement

BOEM encourages the consideration of low-noise foundation types first, and if use of low-noise foundation types is not possible, BOEM encourages the application of one or more noise-abatement systems during impact pile-driving and other low noise best practices. There are three ways to reduce noise during foundation installation of offshore wind farms. The various methods for reducing underwater noise are described briefly here based on the European experience as summarized in Bellmann et al. 2020.

1. One way to reduce noise impacts is to *avoid pile-driving all together* by selecting a different foundation type. There are several foundation types that are under consideration in the New York (NY) Bight, including monopiles, jacket piles, suction mono-bucket, suction bucket jacket, tri-suction pile caisson, and gravity-based structures. See Section J.3.3, *Construction and Installation*, on the various foundation types. The reader is referred to ICF 2021 for a description of the various site conditions required for each foundation type (ICF 2021, Table 10) and the effects by foundation type (ICF 2021, Table 11). While there are no known acoustic measurements of installation, both suction buckets and gravity-based foundations are expected to produce less noise than the installation of monopiles:

    - Suction buckets are installed by pumping water into the suction bucket as it penetrates the seafloor, and then pumping the water out to force it further into the seafloor. This pumping action produces noise but is not likely to exceed noise limits set to protect marine life.

    - Gravity foundations are composed of heavy material that weighs them down to the seafloor. The installation of these may require site preparation work, such as dredging, to ensure the seafloor beneath the foundation is flat so it will not move. For an understanding of dredging noise and its potential effects, the reader is referred to PEIS Section 2.1.2.1.1 on site preparation.

    - In all installation approaches there is also noise associated with the vessels required for conducting these activities, which may include dynamic positioning for certain activities. Several vessels and different types may be needed, including a barge for towing the gravity base, or a dedicated installation vessel for the impact pile-driving hammer.

2. If an alternative foundation type cannot be used, technology can be applied such that pile-driving noise can be *reduced as it is produced*. These technologies include:

    - Vibratory pile-driving. A vibratory hammer provides a method for partially driving piles at lower sound levels than impact pile-driving. Injury is less likely from vibratory hammering as the impulsive nature of impact hammer strikes produces a greater likelihood of injury. Vibratory hammers will be insufficient to completely drive foundation piles and some impact hammering will be required.

    - The IQIP BLUE hammer. IQIP EQ-Piling uses a longer impact force from a contained water mass to transfer energy to the pile and estimates a 20-dB reduction in sound levels relative to equivalent impact hammer strikes (IQIP 2024a).

    - The IQIP Pulse Unit. The IQIP Pulse Unit uses an impact hammer with a volume of water between the hammer and pile to reduce the amplitude of the pile-driving strike. Noise reduction up to 6–10 dB (SEL) is estimated from this device (IQIP 2024b).

- The Menck Noise Reduction Unit. The Menck Noise Reduction Unit augments the force applied by the hammer to the pile head with noise level reductions of 9–12 dB (Acteon 2024).

3. Finally, a common way to reduce noise impacts from pile-driving is by reducing the amount of noise that gets *transmitted through the water*. Technologies that can be used to dampen the sound in the water column include:

    - The Hydro-Sound Damper uses sound absorbing elements attached to a net deployed circumferentially around the pile to reduce the sound levels by 10 to 12 dB (SEL) (Bellmann et al. 2020).

    - The AdBm Noise Mitigation System similarly utilizes volumes of air contained in plastic Helmholtz resonators deployed around the pile with published reductions of 8 dB (SEL) (Wochner 2019).

    - The HydroNas is a deployable fabric sleeve that inflates to surround the pile with a layer of air. The manufacturers advertise a reduction of 25 dB (SEL) (HydroNas 2023).

    - The IQIP Noise Mitigation Screen uses an impedance mismatch (like the aforementioned systems) to reduce the propagated noise levels between 13 and 17 dB (Bellmann et al. 2020).

    - The Grout Annulus Bubble Curtain is a bubble curtain that is generated between a pile sleeve, like the IQIP Noise Mitigation Screen, and the pile with noise reductions of 2–7 dB (Bellmann et al. 2020).

    - Big Bubble Curtains are generated around pile-driving locations from hoses that emit pressurized air in configurations of up to three concentric hoses to introduce an impedance mismatch to reduce the propagated sound levels by up to 20 dB (Bellmann et al. 2020). The Big Bubble Curtains can be used in most if not all projects and have been used in all U.S. offshore wind projects to date.

Many of these near-field resonator systems are tunable to reduce certain frequencies of sound, with lower frequencies being more difficult to target. The options outlined here may not be comprehensive; other systems may exist or be under development that are similar in principle to the approaches outlined here. In addition to the Bellmann et al. (2020) and ICF (2021) reports, a recent workshop was conducted that identified the advantages and disadvantages of the various noise-mitigation systems available today (Green et al. 2023). As an example, none of the systems to date reduce noise associated with pile-driving in the substrate. This will be an area for future innovation. Many of these options are not mutually exclusive; however, thus far, only one near-field system (i.e., Hydro-Sound Damper, AdBm Noise Mitigation System, HydroNas, IQIP Noise Mitigation Screen, and Grout Annulus Bubble Curtain) has been used at a time. Capacity, logistics, imagination, and motivation are the only limiting factor to the combined use of, for example, the IQIP Noise Mitigation Screen and Hydro-Sound Damper. These near-field systems can also be used in combination with bubble curtains for further noise reduction. The

IQIP Blue hammer, IQIP Pulse Unit, and Menck Noise Reduction Unit cannot be used together and therefore only one would be usable for a project.

J.4 Acoustic Assessment

Chapter 3 of the PEIS provides a high-level qualitative assessment of impacts of sound on marine life based on the information available related to the NY Bight alternatives and the mitigations contained within these alternatives. This section supplements the Chapter 3 findings by providing more detail on potential acoustic impacts and uses a relativistic risk assessment framework to discuss tradeoffs to marine mammals associated with the alternatives and select avoidance, minimization, mitigation, and monitoring (AMMM) measures under consideration.

Over the last decade, Bureau of Ocean Energy Management (BOEM) has funded the development of a risk assessment framework that can be used to assess the relative risk to marine mammals of acoustic disturbances associated with different development scenarios. This relativistic risk assessment framework is the foundation for the analyses in this section. The framework was most recently used for oil and gas activity in the Gulf of Mexico (Southall et al. 2021a) and for potential offshore wind development in New England waters (Southall et al. 2021b). The framework identifies risk to marine mammals based on the exposure, or the spatio-temporal-spectral overlap of noise-generating activities with the marine mammals, and considers numerous contextual variables that define the vulnerability of a species to acoustic disturbances. The framework has been effective in comparing the *relative risk* of different development scenarios and the *relative risk* of each scenario between species.

Due to the programmatic nature of this PEIS and the long lead times in the regulatory process, many details needed to fully complete the risk assessment framework for the NY Bight projects are still unknown. Therefore, this assessment draws on thematical findings from a completed hypothetical case study (Southall et al. 2021b) that analyzes the development of two wind farms off New England and serves as the best available proxy for the NY Bight analysis at this time.

Using this case study, the analysis to follow focuses on tradeoffs associated with NY Bight alternatives and associated mitigation measures being considered in the PEIS to lessen the extent of acoustic disturbance on marine mammals associated with pile-driving and, to a lesser extent, vessel noise. This analysis is done through assessing the potential changes in exposure risk of marine mammals to noise with different AMMM measures. The vulnerability of a species is also an important factor in assessing the overall risk of offshore wind development on marine life, but this factor cannot be directly controlled for in this analysis and therefore is not analyzed further.

The use of this framework does not replace sound field modeling and other standard numeric modeling exercises at the project level, which are needed for specific purposes such as informing take estimates and mitigation zones.

J.4.1 NY Bight Alternatives

The PEIS analyzes three alternatives:

- **Alternative A (No Action Alternative):** No development would occur on any of the six NY Bight lease areas. There would be no acoustic impacts associated with the development of the six NY Bight lease areas under Alternative A. This alternative is not discussed further in this assessment. However, note that Section 3.5.6.3 of the PEIS still discusses noise impacts on marine mammals associated with the No Action Alternative that exist regardless of the presence of any NY Bight project development.
- **Alternative B – No Identification of AMMM Measures at the Programmatic Stage:** Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts.
- **Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage:** Alternative C consists of two sub-alternatives:
    - **Sub-alternative C1 (Preferred Alternative): Previously Applied AMMM Measures.** Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in Construction and Operations Plans submitted for the Atlantic OCS or through related consultations. The analysis for Sub-alternative C1 is presented as the change in impacts from those discussed under Alternative B.
    - **Sub-alternative C2: Previously Applied and Not Previously Applied AMMM Measures.** Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not been previously applied. Therefore, under this alternative, the analysis is presented as the change in impacts from those discussed under Sub-alternative C1. In the case where there are no AMMM measures applied under Sub-alternative C1, the analysis for Sub-alternative C2 is described as the change in impacts from those discussed under Alternative B.

Alternatives B and C analyze impacts at both a single project level and across all six proposed projects. The acoustic impacts associated with the development of the six NY Bight lease areas under Alternative B and C will be discussed, to the extent possible, in sections later in this document.

J.4.2 Overview of Relativistic Risk Assessment Framework

A team of experts recently developed the newest iteration of their acoustic risk assessment framework for marine mammals (Wood et al. 2012); the most recent framework considers aggregate acoustic exposures from the construction and operation of multiple wind farms (Southall et al. 2021b, 2023). The framework was intentionally designed to be tunable to allow users to assess specific scenarios based on the temporal, spatial, and spectral overlap of noise-generating activities and marine species. Their case study for offshore wind development in New England (Southall et al. 2021b, 2023) provides a useful analog to the potential development in the NY Bight and is used here to consider the relative risks posed by the alternatives and associated mitigations considered in the PEIS.

This framework is based on an exposure index (representing the probability of exposure of a species to an activity) and the vulnerability index (representing the inherent vulnerability of a given species to anthropogenic disturbance) (Figure J-3). The resultant risk value is calculated for each species and each month of a specified scenario, providing high-level insights about the spatio-temporal-spectral interactions and risk trade-offs associated with different development scenarios.

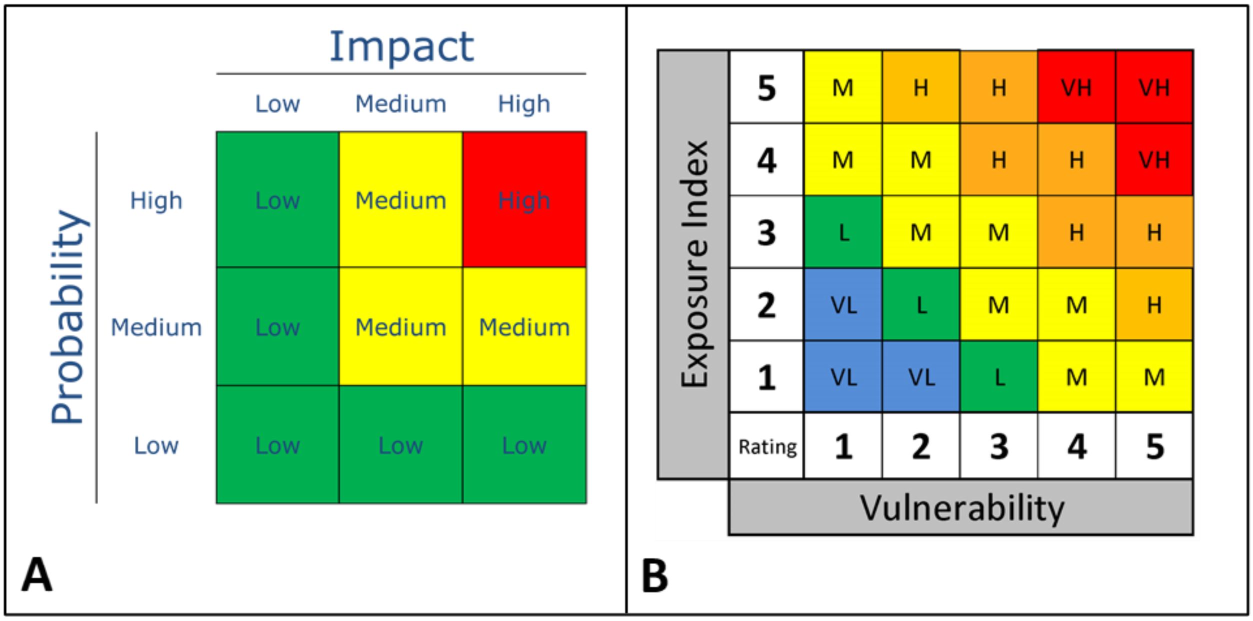

Figure J-3. Generic risk assessment matrix (left) and risk assessment matrix from Southall et al. (2021b, 2023) (right)

A. Example risk assessment matrix.
B. Risk assessment matrix from Southall et al. (2021b, 2023). The exposure index reflects the spatial, spectral, and temporal overlap of the noise event and the species at hand, and the vulnerability axis reflects species-specific contextual factors.

J.4.2.1 Exposure Index

The exposure index aims to quantify the “severity” of a given noise event by considering the spatio-temporal extent of a noise-generating activity and its overlap with the spatio-temporal presence of a species. The spatial component of the exposure index is based on the area within which a behavioral response is likely to occur (but can be tuned to reflect any type of response, ranging from auditory detection to auditory injury). The temporal component considers the proportion of a population present at a given time in the spatial area that is exposed, in comparison to the overall population present over a larger geographic zone or region at the same time. The spectral content of the noise source is considered to focus on the portion of the noise that actually overlaps with the hearing range of each marine mammal hearing group (Southall et al. 2007). The exposure index is calculated separately for each wind farm, month, and species combination. An aggregate exposure index also can be calculated for an individual species for a defined project development scenario by summing the monthly exposure index values across a year. This value is normalized by the number of animals in the geographical zone (or local population as may be referred to here) to obtain a percentage, such that the aggregate exposure index percentage represents the portion of the population that would be exposed.

J.4.2.2 Vulnerability Index

The vulnerability index aims to quantify the baseline vulnerability of a given population. Therefore, it is species-specific, and includes the following factors: (1) the spatio-temporal presence of the species in the activity area, (2) the species' ecological use of the activity area and environmental risk factors of the specific area considered, (3) the hearing capabilities of the species, and (4) the general trends in the size and health of the population. As these factors may change over time, these are evaluated at a monthly resolution to capture the temporal variation in vulnerability associated with these factors.

J.4.2.3 Final Risk Score

The final integrated risk score for a species is assessed by intersecting the exposure index and vulnerability index on a five-by-five matrix (which is skewed toward the exposure index), depicting the relative risk with a color bar reflecting highest, higher, moderate, lower, and lowest risk. Because the parameters of both the exposure index and vulnerability index are specified for each development scenario of interest, a separate risk matrix will be obtained for each specific geographic area, species, and activities considered and should only be used to assess *relative* risk within the scenarios analyzed. This analysis should not be considered a measure of absolute risk.

J.4.2.4 What the Framework Is and Is Not

Due to the broad temporal and spatial resolution of this framework in its current form, it cannot be used to evaluate specific interactions between individual animals and individual noise-generating events. The framework provides a broader view of the effect of larger-scale or longer-term projects on a given population and gives insight about *relative* risk of the multiple scenarios under consideration and the *relative* risk posed to each species. In its current form, the framework makes no attempt to differentiate between the types of effects (i.e., injury, behavior, or masking) because acoustic disturbance is considered more generally as an exposure term; however, the exposure term could later be tuned to consider specific types of effects. This framework also does not include noise propagation modeling, individual animal movement, or energetic model assumptions; these factors will be considered at the project level.

J.4.3 Overview of Hypothetical New England Wind Farm Case Study

The acoustic risk assessment framework was most recently used to explore the trade-offs associated with hypothetical wind farm development in southern New England waters (Southall et al. 2021b), herein referred to as the "case study." This case study provides a useful analog for offshore wind farm development in the NY Bight due to similarities in geographic location and trends in species occupancy in the area. The case study is being introduced and described here to provide insight about the possible spatio-temporal-spectral factors that should be considered with respect to the alternatives being considered for offshore wind in the NY Bight.

The hypothetical wind farms considered in the case study include two wind farms in southern New England, located ~35 km apart (Figure J-4). This distance was chosen so that the wind farms would be near to each other, but any acoustic impact radii associated with the two wind farms would be expected to be non-overlapping. Although the parameters of these wind farms are realistic, they were not intended to represent a specific project.

- Wind farm 1 (WF1): 25 by 25 km^2 area (150,000 acres), 180 monopiles
- Wind farm 2 (WF2): 10 by 20 km^2 area, (50,000 acres), 60 monopiles

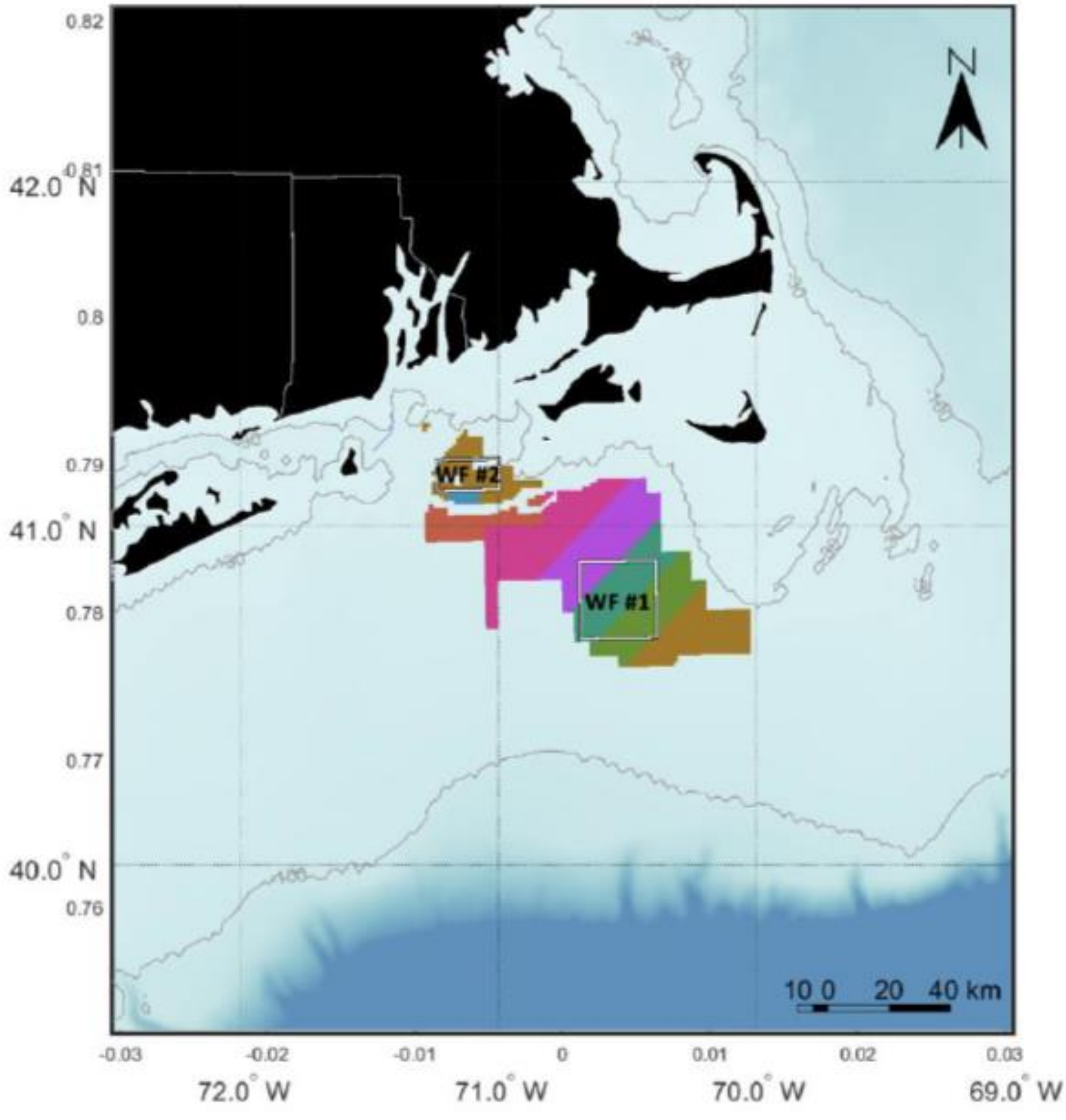

Figure J-4. Hypothetical New England wind farm locations off Massachusetts

Offshore leased areas shown in colored polygons, with two white rectangles outlining the locations of the two wind farms assessed.
Source: Southall et al. (2021b).

The team assessed the relative risk to these focal species for the following reasons:

- **North Atlantic Right Whale (NARW)**: Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) listed and in the low-frequency hearing group.
- **Humpback whale (humpback)**: not ESA listed but a relatively common whale in the low-frequency hearing group.
- **Common dolphin (dolphin)**: an odontocete in the mid-frequency hearing group; very common in the geographic analysis area.
- **Harbor porpoise (porpoise)**: a less common odontocete but particularly sensitive to noise; represents the high-frequency hearing group.
- **Gray seal (seal)**: represents the phocid pinniped group; increasingly common in the geographic analysis area, although less so in the open ocean of the continental shelf.

For simplicity, these species are referred throughout by the short-hand term listed next to the species name in parentheses in the previous list.

The spatio-temporal presence of these species in the geographical locations of the hypothetical wind farms was obtained from the Roberts et al. (2020)[1] marine mammal density data set. A monthly risk matrix was calculated for each of the five species for a 3-year time span. See Southall et al. (2021b) for complete details of the New England case study and risk assessment process, including components not further discussed here (e.g., masking).

J.4.3.1 Exposure Index Calculations

Year 1

The objective of the Year 1 assessment was to explore the trade-offs associated with construction timing, the duration of pile-driving each day, and the use of mitigation (noise abatement). The following details provide the parameters and assumptions used in calculating the exposure index for all five species in Year 1.

J.4.3.2 Scenarios

- 120 foundations were installed on WF1; pile-driving was the main contributor of noise.
- Option of either unmitigated or mitigated pile-driving (using noise abatement).

[1] Although gray seal is the species specified here, the Roberts et al. (2020) data is not specific to that species of seal. This specific species was considered for obtaining information relevant to other components of the vulnerability score.

J.4.3.3 Spatial Component

- The authors used measurements made during the installation of a 7.8-m monopile with (mitigated) and without (unmitigated) a double bubble curtain during the construction of the Coastal Virginia Offshore Wind Farm (OCS-A 0497) (Ørsted 2020) to calculate the radial distance around each pile at which the received levels to behavioral impact would be exceeded.
    - Harbor porpoise
        - Behavioral disturbance would occur at a received level of 120 dB re 1 µPa; this sound level was exceeded at distances up to:
            - 20 km for the unmitigated scenario.
            - 15 km for the mitigated scenario.
    - Other four marine mammals considered
        - Behavioral disturbance would occur at received levels of 160 dB re 1 µPa; this sound level was exceeded at distances up to:
            - 10 km under the unmitigated scenario.
            - 5 km for the mitigated scenario.

J.4.3.4 Temporal Component

- Three potential construction start dates explored: March 1, May 1, or July 1.
- Option of either one pile driven per day or two piles driven per day:
    - Total duration of pile-driving: 4 months for one pile/day.
    - Total duration of pile-driving: 2 months for two piles/day.

J.4.3.5 Spectral Component

The spectral index is calculated by multiplying the species abundance number by a coefficient that indicates the spectral overlap of the noise and the functional hearing (Southall et al. 2007) of the marine mammal species under consideration. This calculation deemphasizes the exposure (essentially decreasing the number of animals exposed) if the spectral energy in a signal is outside the frequencies that the species hears best. To do this weighting a spectrum of the source signal was needed. For pile-driving, a spectrum from HDR (2020) was used from the pile-driving installation of a 7.8-m monopile measured within 3 km of the monopile.

J.4.3.6 Year 2

The objective in the Year 2 assessment was to explore the relative interactions and cumulative effects associated with installation of more than one wind farm, as well as the trade-offs associated with the timing of installation.

J.4.3.7 Scenarios

- 60 foundations were installed on WF1, and 60 installed on WF2; pile-driving was the main contributor of noise.
- Only considered unmitigated pile-driving and installation of one pile/day.

J.4.3.8 Spatial Component

- Same as Year 1 unmitigated scenarios (20 km for porpoises and 10 km for all other species considered).

J.4.3.9 Spectral Component

- Same as Year 1.

J.4.3.10 Temporal Component

- The analysis explored three installation timing scenarios that affected the temporal component of the exposure index. The scenarios all assumed installation of only one pile/day but varied in the degree of overlap between the two nearby windfarms:
  - *Sequential installation*: WF1 construction July/August, WF2 construction September/October (total of 4 months to install 120 foundations).
  - *Partial overlap*: WF1 construction July and August; WF2 construction August and September (total of 3 months to install 120 foundations).
  - *Total overlap*: WF1 and WF2 construction August and September (total of 2 months to install 120 foundations).

J.4.3.11 Year 3

The objective in the Year 3 assessment was to explore the relative risk associated with the operational phase of offshore wind development. The following assumptions were made for Year 3.

J.4.3.12 Scenario

- Both WF1 and WF2 were fully operational.

- Operational noise from each turbine and vessel noise (defined by vessel type, number of trips, speed, and trip duration) were the main contributors of noise.

J.4.3.13 Spatial Component

- *Operational noise:* The radial distance to the behavioral thresholds for an operating turbine was considered to be 100 m for all species (Tougaard et al. 2020). It is worth noting that the spatial extent of exposure for turbine operations was also a function of the number of operating turbines and thus was twice as large for WF1 than WF2.
- *Vessel noise:* The exposure associated with vessel noise was calculated as a function of vessel speed in the wind farm area (31 km/hour), average length of a vessel trip (4 hours), and the radius of behavioral response, which was assumed to be 0.5 km from a vessel (Holt et al. 2021). These estimates were based on a crew transfer vessel, which is expected to be the most prevalent in the area during operations and maintenance times.

J.4.3.14 Temporal Component

- *Operational noise* was considered to be uniform throughout the year.
- *Vessels* were assumed to make 30.8 trips each month to WF1 and 10.3 trips each month to WF2, with a uniform distribution across the year.

J.4.3.15 Spectral Component

- *Operational turbine:* The authors used a spectrum measured by Ingemansson Technology AB (2003) during wind speeds of 14 m/s, measured within 83 m of the turbine.
- *Vessel noise:* The authors used a spectrum measured by Hermannsen (2014) at 100 m from a vessel transiting at 30 km/hour.

For complete details of the New England case study and risk assessment process, including components not further discussed here (e.g., masking and vulnerability index), see the full report by Southall et al. (2021b). Note: the utility of the risk assessment framework for offshore wind has been summarized in Southall et al. 2023.

J.4.4 Overview of Findings from the New England Case Study

Overall, the New England case study identified several key results and mitigative principles.

J.4.4.1 Results

- The lowest exposure risk associated with pile-driving coincided with times of lowest animal abundance.

- Mitigated pile-driving reduced the overall exposure indices in comparison to unmitigated pile-driving.
- Of the scenarios explored, there was no common strategy for minimizing exposure risk to each species with the installation scenarios explored (i.e., *sequential installation, partial overlap, total overlap*).
- The exposure risk associated with the construction of multiple wind farms is not additive and depends heavily on the spatio-temporal overlap of the animals and the activity. Higher relative exposure risk is expected when activity overlaps most in time and space with the location of the animals.
- The relative noise exposure risk of offshore wind development on marine mammals is higher for low frequency cetacean (LFC) than mid frequency cetacean and high frequency cetacean due to the low frequency nature of the noises most-commonly generated during offshore wind development (i.e., pile-driving and vessel noise).

J.4.4.2 Mitigative Principles

- A reduction in noise at the source could reduce the spatial extent of potential exposure to all species.
- Focusing activity (pile-driving or vessel activity) to times when animals are not present or are in very low abundance in the area could decrease the risk to marine mammals. As no time exists when no animals are present, the specific trade-offs to certain species would have to be weighed against conservation needs and priorities.
- Increased monitoring could lead to increased opportunities to further mitigate effects on marine mammals.
- For some species, some temporal overlap in construction windows could reduce aggregate impacts, while for other species, it may increase it. During project planning, careful consideration should be given to the spatio-temporal distribution of species of interest with the overlap of the spatio-temporal aspects of development. With an adaptable development timeline, risks to marine mammal species of interest could be reduced.

The details of these results follow. The discussion focuses on results from the one pile/day unmitigated scenario as these parameters were used consistently across Years 1 and 2 in the New England case study. Examples from other scenarios will be used to highlight key points and will be specifically called out. Each species had a different vulnerability index, which is a critical component of the overall risk assessment but is not discussed further here as the primary purpose is to consider the ways that different development scenarios affect the exposure index.

J.4.4.3 Year 1

The difference in the results across the three start time scenarios for a given species was primarily driven by the animal abundance, with the lowest risk occurring when pile-driving coincided with the times of lowest animal abundance. Animal abundance can change drastically over a year for some species. For the NARW and harbor porpoise, the lowest aggregate exposure resulted from a July start, while for humpbacks and seals, it was a May start, and for common dolphins, a March start (Table J-1).

Table J-1. Aggregate exposure index percentages over the course of the year for each construction start time scenario by species for the one pile/day, unmitigated scenarios

Species	March Start	May Start	July Start
NARW	3.1915	2.8316	2.3398
Humpback	1.1440	0.8271	0.8649
Dolphin	0.1747	0.2540	0.4438
Porpoise	1.3046	1.0413	0.8522
Seal	0.7096	0.1470	0.1671

In comparing the one pile/day versus the two piles/day unmitigated scenarios, when pile-driving started in July, the two piles/day scenario posed a lower exposure risk to all species except porpoise (Table J-2). In contrast, when pile-driving started in either March or May, the exposure index was higher for every species (except dolphins) in the two piles/day scenario (Table J-2). *This suggests that pile-driving noise exposure, and consequently the overall risk to the five marine mammal species considered here, can be substantially lowered by concentrating pile-driving efforts when the fewest animals are present in the area.*

Table J-2. Aggregate exposure index percentages for each construction start time scenario by species for the two piles/day, unmitigated scenarios

Species	March Start	May Start	July Start
NARW	4.1906	3.6195	2.0325
Humpback	1.3793	0.9281	0.7206
Dolphin	0.1357	0.2141	0.2965
Porpoise	1.4826	1.1235	0.9537
Seal	0.9322	0.2398	0.1074

However, given that not all species are affected equally due to their different distributions throughout the year, the specific trade-offs to certain species would have to be weighed against conservation needs and priorities, and care is needed when considering the timing of these events. It is important to emphasize that for some species, the risk would increase for two piles/day versus one pile/day if the timing does not coincide with periods of lowest abundance. For example, a March start date with the two piles/day scenario led to higher exposure indices than one pile/day for certain species (NARW, porpoise, seal). That is because these species have higher densities in the geographical area during March than in July. Thus, when animals are more abundant, the exposure index is higher in a two piles/day scenario.

Intuitively, the exposure index was always lower in the mitigated scenarios versus the unmitigated scenarios because the spatial component of the exposure index was smaller. For a reduction in the behavioral impact range from 10 km down to 5 km, the decrease in the resulting exposure index was four-fold, since the area exposed is reduced as a function of r^2. This consistently led to a change in the integrated risk assessment score by at least one step (e.g., lower to lowest) when comparing the mitigated and unmitigated case of the same scenario, although in many cases the risk decreased by multiple steps (e.g., from highest to moderate). *This finding suggests that anything that can be done to reduce the spatial extent of noise exposure will reduce overall risk from noise across species.*

This overall synthesis demonstrates the utility of this framework for identifying the risks and tradeoffs to multiple species associated with different potential development scenarios. It also demonstrates that, with an adaptable development timeline, risks to marine mammals can be reduced.

J.4.4.4 Year 2

The Year 2 analysis considered only the unmitigated one pile/day conditions for the construction of 60 piles at each of two wind farms in either a sequential, partial overlap, or total overlap construction scenario. Based on the Year 1 findings, only the late summer/fall seasons (July–October) were considered for pile-driving as this was the period with the lowest overall risk to the species analyzed.

When comparing the three installation timing scenarios, the lowest aggregate exposure for three of the five species (NARW, dolphin, seal) occurred with the partial overlap scenario, while the sequential construction led to the lowest aggregate exposure for humpback whales and total overlap led to the lowest aggregate exposure for porpoise (Table J-3). *These results suggest that for the scenarios explored in the New England case study, a condensed construction timeline may help to reduce the exposure for marine mammals, but consideration needs to be given with respect to species of interest, their density, and distribution at each of the construction sites for the times when construction is anticipated, as no common reduction was seen across all species by condensing construction. Similar trade-offs would likely exist if additional species were also considered, and in the case of the NY Bight.*

Table J-3. Aggregate exposure index percentages for each construction timeline approach by species

Species	Sequential Construction	Partial Overlap	Total Overlap
NARW	1.8415	1.6665	1.6775
Humpback	2.1419	2.2610	2.3287
Dolphin	0.2592	0.2341	0.3358
Porpoise	0.7455	0.5649	0.5090
Seal	0.3579	0.3327	0.3715

To understand the difference in aggregate exposure of two wind farms near each other being constructed instead of one wind farm, this analysis compared the Year 1, unmitigated, one pile/day, July start scenario with Year 2 sequential installation results. In both scenarios, a total of 120 piles were driven over 4 months. There was no common trend across all species; for some species (i.e., humpbacks and seals), the construction of one wind farm led to lower aggregate exposure, whereas for other species (i.e., NARW, dolphins, and porpoise), the construction of two wind farms led to lower aggregate exposure (Table J-4). The differences across species were driven by small-scale differences in animal densities at WF1 versus WF2, underscoring *the need for careful consideration of the spatio-temporal distribution of species of interest with the overlap of the spatio-temporal aspects of development during planning.*

Table J-4. Aggregate exposure index percentages for Year 1 and Year 2 by species

Species	Year 1	Year 2
NARW	2.3398	1.8415
Humpback	0.8649	2.1419
Dolphin	0.4438	0.2592
Porpoise	0.8522	0.7455
Seal	0.1671	0.3579

Notes: **Year 1**: unmitigated, one pile/day, July start scenario of Year 1 construction of WF1; **Year 2**: unmitigated, one pile/day, Year 2 sequential construction of WF1 and WF2.

These results demonstrate that there are species-specific differences in the magnitude and direction of change in aggregate exposure associated with the development of one versus multiple wind farms, linked to the specific location of the wind farms and construction timing, which interact differently with the unique spatio-temporal distribution of the species. In terms of the NY Bight, this is surely to be the case. For example, one of the NY Bight lease areas is located closer to shore than the other five. As a result, there are clear differences in the density magnitude of certain species there than at the other lease areas, although there are similar seasonal presence trends at all of the NY Bight lease areas. In particular, dolphins are present in lower numbers and seals are present in higher numbers at the more coastal lease area than in comparison to the other lease areas. Because many of the species considered are migratory animals there are also differences that can be expected due to the latitudinal range of a species. Therefore, it seems reasonable to expect different exposure risk across the lease areas. The cumulative exposure associated with the build-out of two or more wind farms simultaneously will depend on the construction timing and wind farm locations. For the NY Bight, if multiple wind farms will be constructed simultaneously (e.g., sequentially, or some degree of overlap), this relative risk framework can be used to identify a construction scenario that reduces aggregate exposure for priority species.

J.4.4.5 Year 3

Both vessel noise (primarily from wind farm maintenance) and turbine operational noise were considered in Year 3. Because the exposure index results were higher for vessel operations than operating turbines, the exposure index results reported were only a function of vessel operations. The authors of the analysis emphasized caution in using the results of the Year 3 analysis as there were no large-scale wind farms in operation in the United States from which to build the necessary assumptions for this part of the case study. Therefore, the case study was informed by the best available, albeit cursory, knowledge of likely vessel use during the operational phase of a wind farm; the assumption is that vessels would primarily be used to transfer crew for maintenance of the turbines.

The case study assumed that vessel use would be uniform across the year, leading to a higher aggregate exposure for several species (NARW, humpback, and gray seals) for the Year 3 scenario compared to the Year 1, July start scenario. The case study demonstrated this result despite generally *lower* exposure risk associated with vessel noise in any given month. Because the aggregate exposure index is calculated by summing across all months with the assumption that there was vessel activity in every month, the aggregate exposure index percentage associated with vessel noise was *higher* than for pile-driving, assumed to occur for only 2 to 4 months of a given year. It is worth noting that exposure risk in this analysis does not specifically mean risk of auditory injury, but rather the potential risk to some noise effect. A uniform distribution was assumed for vessel activity across the year, leading to high aggregate exposure. Similar to restricting pile-driving activity to certain times of the year, *there may be decreased relative risk to marine mammals if maintenance of wind farms could coincide with periods of low marine mammal abundance.* For example, for humpback whales and the NARW, concentrating maintenance activity to the summer and early fall could lead to the lowest relative risk for these species. *Because the seasonality of marine mammals is similar in the NY Bight and New England waters, this potential mitigation could also hold true for the NY Bight.*

Although this analysis focused on vessel noise, the results also are relevant to vessel strike risk. Minimizing the exposure to vessel activity in general could mitigate both vessel noise and vessel strike risk.

J.4.4.6 Final Remarks on New England Case Study

A final observation of this analysis is that there are still limitations in our understanding of where and when animals are present on the OCS, in particular the lack of data on species vulnerability. This gap was particularly the case for seals and harbor porpoise in the area where the scenarios were being considered. *This deficiency may be overcome with increased long-term, continuous, and comprehensive monitoring efforts. Long-term Passive Acoustic Monitoring (PAM) to collect additional information about the presence and distribution of marine mammals is an AMMM measure considered for the NY Bight.*

While considering the results for the New England case study, it is important to keep a few things in mind. These results are provided here to understand how noise exposure might be reduced with different approaches and the trade-offs for each approach. This understanding is the emphasis of this analysis, not the absolute numbers presented from the case study. By staying within the limiting parameters (similar seasonality and overall abundance between the NY Bight and southern New England, for example), valid conclusions can still be extrapolated from even relative results for specific and well-chosen questions.

The results and mitigative principles from the New England case study informed the identification of noise-related AMMM measures and guided the discussion of the acoustic impacts of the alternatives.

J.4.5 Comparison of Southern New England and NY Bight

The United States East Coast can be divided into different ecoregions based on species distributions, ecological processes, geology, oceanography, biology, environmental threats, among other factors

(Greene et al. 2010). The NY Bight/southern New England area forms one ecoregion. Relative to the rest of the Atlantic OCS, the NY Bight and southern New England are fairly similar and likely to serve similar ecosystem services. Therefore, the presence, abundance, and ecological use of the NY Bight lease areas by marine mammals is not expected to differ greatly from the area of the hypothetical wind farms in the New England case study, and the case study can be used to make inferences about potential wind farm development in NY Bight.

To confirm that this assumption was reasonable, BOEM used the marine mammal data that informed the case study (Roberts et al. 2020) to compare the densities of marine mammals in the New England case study area to the lease areas under consideration in the PEIS. Since the completion of the case study, however, the marine mammal density data has been updated (Roberts et al. 2016, 2023), so BOEM also compared marine mammal densities between the two areas using the more recent models (Figure J-5). In most cases, the marine mammal densities at the New England locations were similar to or greater than the densities for the NY Bight, which means the results of the case study are somewhat conservative and can potentially serve as an upper bound for potential risk in similar scenarios. However, for common dolphins, the density in the NY Bight was generally higher than New England, so the potential risk identified in the case study is likely an underestimate for this species.

- Harbor porpoise and seal density in the New England case study was generally similar both in magnitude and seasonality to the NY Bight lease areas, though for WF2 the largest peak in seal density was in winter as opposed to in the spring for WF1 and the NY Bight lease areas. The overall trend remained the same: seals were present in high numbers in both locations in the winter and spring and not present, or present in low numbers, in the summer and early fall.

- For the NARW, the seasonality patterns were similar; there were few animals present in summer and fall, but more animals were present in winter and spring. However, the number of animals in the New England wind farms were much higher, suggesting the results from the New England case study should serve as an upper bound for the NARW in the NY Bight.

- For humpback whales, there was a 1-month difference in the timing of the peak humpback density in the fall. This peak occurred in September for New England and October for the NY Bight.

- For common dolphins, the general distribution across the year was similar, but the number of animals in the NY Bight lease areas was higher than in the New England wind farm locations. One outlier in the NY Bight leases was OCS-A 0544, the most coastal of the NY Bight leases. This area had lower overall densities across the year than the other NY Bight lease areas and represents a more coastal location than the other lease areas. This trend is similar to the magnitude difference in the New England wind farms, where WF2 (the more coastal site) has lower overall numbers of animals in comparison to WF1. Therefore, the two New England wind farm locations capture the variation seen in common dolphin density between coastal and offshore locations in the NY Bight lease areas.

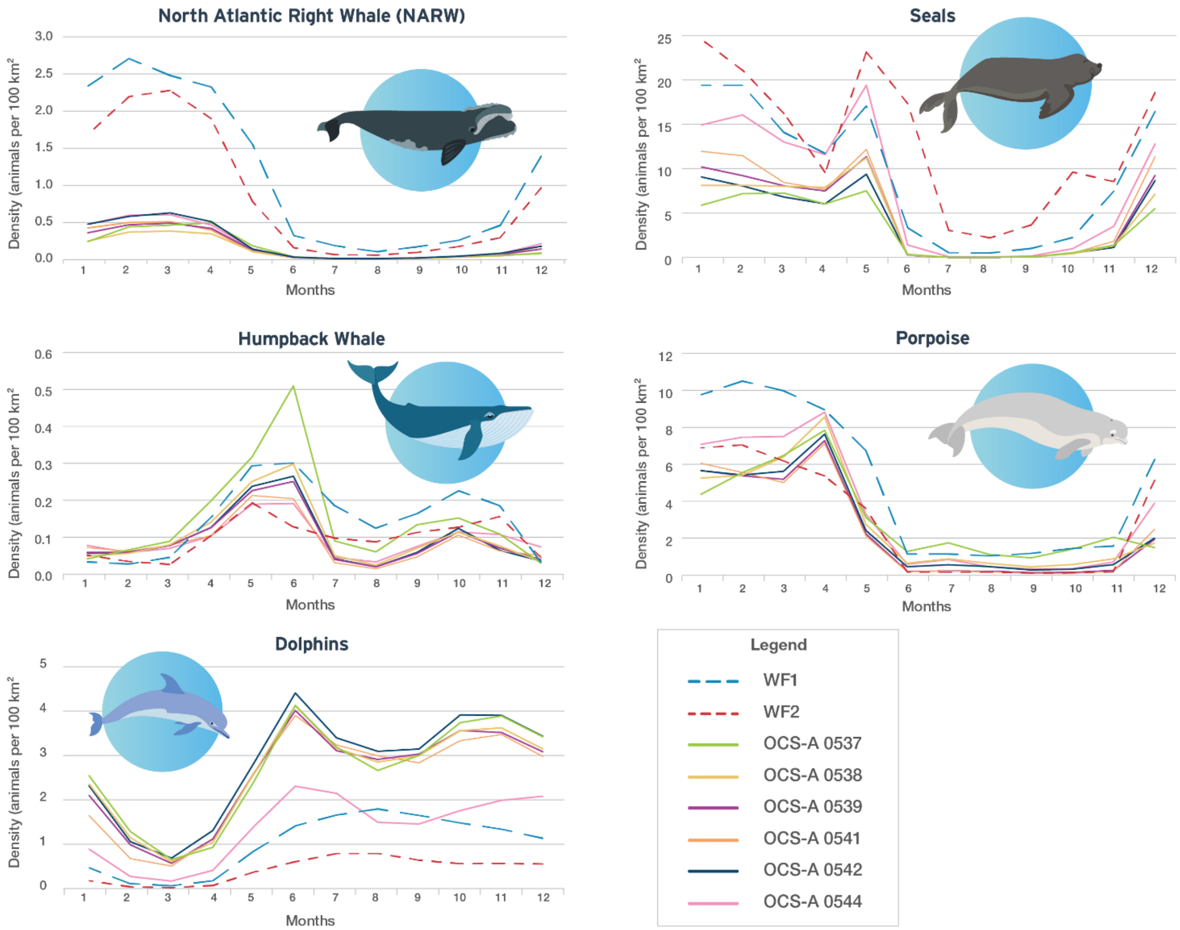

Figure J-5. Comparison of average animal density in the New England hypothetical wind farm areas (WF1 and WF2) with the average animal density in the NY Bight lease areas (OCS-A 0537, 0538, 0539, 0541, 0542, and 0544)

Note: The y-axis scales are different among the plots.
Source: Roberts et al. (2022).

In summary, the density distribution differences identified for each species between the New England wind farms and NY Bight lease areas point to only a few shortcomings in the overall applicability of the New England case study findings to the NY Bight. First, that the densities associated with the common dolphin, particularly those associated with WF1, may be less than for the NY Bight, which could underestimate the risk to common dolphins. However, common dolphins had the lowest assessed risk of any of the species considered in the New England case study, in part, due to their low vulnerability. Second, some species' densities in the NY Bight lease areas exceed those of the hypothetical wind farms at certain times of the year, such as for humpback whales in spring and early summer at OCS-A 0537. However, this difference is acceptable because this programmatic-level assessment considers the general trend in density distribution across the year rather than on a single month resolution.

J.4.6 Discussion of Acoustic Impacts Under Alternative B

Under Alternative B, AMMM measures are not identified at the programmatic stage and the largest spatio-temporal extent of noise associated with the development of offshore wind in the NY Bight has the potential to be realized. Pile-driving would be expected to be the greatest contributor to potential noise-associated effects on marine mammals.

Under Alternative B, pile-driving would not be excluded in certain time periods, including periods when species of greatest concern such as the NARW could be present, and periods when other species are in high abundance in the area and on the lease site. At the programmatic level, there would not be measures in place to monitor for marine mammals or modify activities should an animal be exposed to impactful levels of sound. Baleen whales and seals would be especially susceptible, as their hearing range overlaps with the low frequency sounds produced during offshore construction activities.

It is difficult to predict the spatio-temporal impact of the project build-outs under Alternative B without an understanding of many of the construction specifics of the NY Bight projects, e.g., construction effort within a day (e.g., number of piles driven in a day), order of construction among the leases, whether construction on one project will overlap in time with one another, and whether construction on a single project will occur all in one year. A few example scenarios using what is known either from the representative project design envelope (RPDE), or what can be built from the New England case study, are provided to help illuminate the subject. These are only illustrations of what could be, and should not be considered as the only possibilities. Until more details are known, these scenarios should only be considered as hypothetical.

J.4.6.1 Build-out of One Project

Marine Mammals Exposed

Year 1 unmitigated results of the New England case study, as previously described, may provide the best available hypothetical example of the relative risk and aggregate exposure associated with the build-out of one project for the NY Bight. However, some limitations should be considered. The case study considered construction of 120 foundations in 1 year, and more construction activity would increase the chance of exposure.

Exposure Time

Based on the RPDE, a maximum of 280 foundations is anticipated for a single wind farm in the NY Bight. If pile-driving takes 4 hours per pile and one pile is driven per day, then 16.66% of a 24-hour period would have pile-driving noise occurring. If the rate increases to two piles/day, the time of pile-driving noise increases to 33.33%. It would take a minimum of 9.33 months to install 280 foundations in a one pile/day scenario, or 4.67 months with two piles/day. (As a reminder, in the case study it took 4 months or 2 months, respectively, to drive 120 piles). In either scenario, or with more piles driven per day for the same total number of foundations, construction noise would occur for 12.78% of the year. The difference is in the amount of “quiet time” per day at or near the pile-driving location, which could be an important factor for animals in the vicinity (i.e., recovery of fatigued auditory systems, offering a break from masking, etc.). If construction occurred continuously in a single year, under a one pile/day scenario, construction during periods when more animals are in the area would be unavoidable for many species, as no seasonal restrictions would be in place at the programmatic level under Alternative B.

Exposure Area

The spatial extent of behaviorally impactful noise levels under Alternative B during a single pile-driving event is anticipated to be of a similar order of magnitude as the unmitigated scenarios in the New England case study, unless mitigation were to be conducted at the project level. The unmitigated pile-driving scenario considered in Southall et al. (2021b) predicted potential effects on marine mammal behavior within 10 km of the foundation being installed. This radius would represent a potential exposure area of 314 km^2 (180% the smallest NY Bight lease area, i.e., 174 km^2; or ~62% of the largest NY Bight lease area, i.e., 510 km^2). Overlapping sound fields would not occur as a result of pile-driving in the build-out of one wind farm unless multiple pile-driving events were conducted at the same time.

J.4.6.2 Build-out of Six Projects

Because so many of the construction details are unknown at the time of this programmatic acoustic assessment, there are countless ways in which six projects could be built out, and it is difficult to predict what the effect of simultaneous build-out of six wind farms would look like. As shown in the New England case study, the aggregate marine mammal exposure associated with the build-out of one wind farm versus build-out of two *was not additive* and was dependent on the site-specific density patterns of a species at the time of construction. However, BOEM does assume that the spatio-temporal exposure would be greater for six wind farms than one and would vary by species. Though the relativistic risk assessment framework would not be used at the programmatic level under Alternative B, it could be used at the project level to predict the relative exposure risk to the marine mammal species of interest by considering the species density and distribution at the construction sites at the time of year planned for construction.

The simultaneous build-out of six wind farms has the potential, albeit unlikely, for overlapping sound fields if concurrent pile-driving is pursued at two close proximity sites. It is not likely that the isopleths associated with injury or behavioral effects (NMFS 2022) associated with construction on lease areas OCS-A 0544 and OCS-A 0537 would overlap with any other NY Bight lease area due to the distance of these wind farms from the other NY Bight lease sites, which exceeds 28 km at their closest points (Figure J-6). For the other lease areas, overlapping sound fields would be unrealistic due to safety concerns between the two operations, equipment logistics, and equipment bottlenecks. However, if pile-driving were to occur simultaneously, the spacing between concurrent pile-driving would have to be within 5 km for the sound fields to add in a meaningful way that could potentially change the impact ranges.

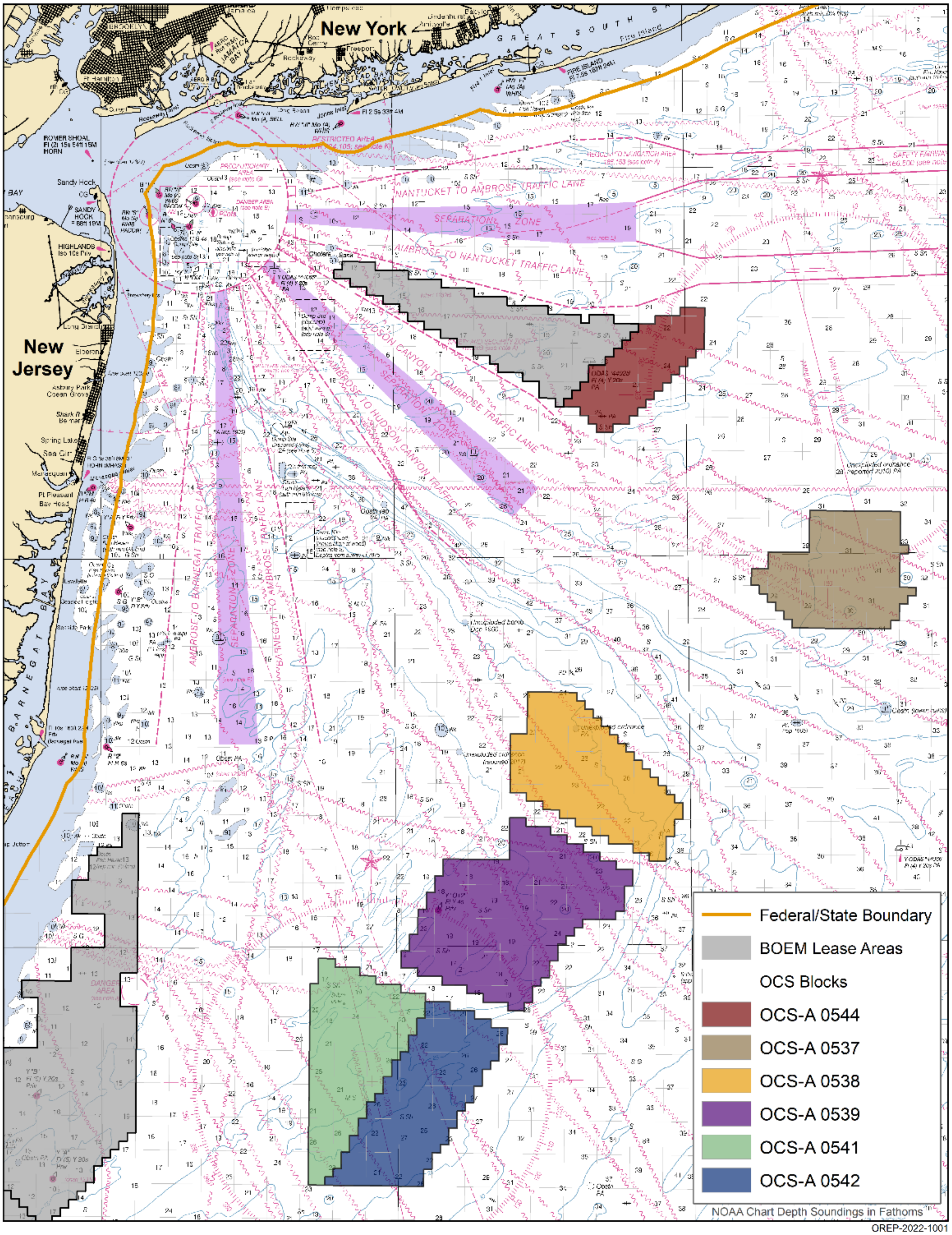

Figure J-6. NY Bight lease areas

J.4.7 Identification of AMMM Measures and Recommended Practices to Reduce Noise Impacts for the NY Bight

The results and mitigative principles from the New England case study were used to inform the identification of AMMM measures and Recommended Practices (RPs) that can potentially reduce noise impacts on marine mammals in the NY Bight. These AMMM measures and RPs fall into several themes. Note that there are other noise-related AMMM measures and RPs that are not discussed further as they neither directly (e.g., reporting requirements) nor indirectly reduce acoustic impacts on marine mammals. The complete list of noise-related AMMM measures and RPs is provided in Table J-5 for reference.

J.4.7.1 Noise-related AMMM Measure and RP Themes

Modifications in offshore wind development activity schedules that limit temporal exposure to noise include:

- Prohibiting or minimizing construction during periods when species of the highest conservation concern (the NARW) are expected to be present in greater numbers in the region (covered under MMST-4).
- Using daytime-only pile-driving (covered under MMST-4).
- Considering increased construction effort in periods with lowest animal density to complete more of the work and shorten total construction timelines:
    - Considering night-time and low-visibility conditions and enhance monitoring (MMST-6, MMST-1).

Measures and RPs that limit the spatial extent of noise include:

- Using equipment, technology, and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment (MUL-5).
- Prioritizing low noise foundations when practicable (MUL-6).
- Received Sound Level Limit (RSLL): Limiting noise levels above the injury threshold for LFC to below a fixed distance from pile-driving (MUL-22).
- Following current International Maritime Organization (IMO) Guidelines for the reduction of underwater radiated noise from vessels to the extent practicable (MUL-7).
- Using soft start for pile-driving (MUL-20).

Use of real-time and near-real time monitoring to inform adaptive mitigation measures include:

- Monitoring clearance/shutdown zones using visual observation and real-time PAM during pile-driving (covered under MMST-2, MMST-4).
- Visually monitoring clearance/shutdown zones during HRG surveys (MMST-12).
- Using real-time PAM detection of marine mammals and alert system for operators near other concentrated development activities (e.g., transit or cable-laying corridor) or between lease areas to increase overall alertness of operators and readiness to implement shut-downs as needed (MM-2).
- Conducting Sound Field Verification (SFV) at every pile at 750 m (abbreviated "SFV"). "Thorough SFV" monitoring (defined as recording along a minimum of two radials with at least one radial containing recorders at three or more distances) must be conducted for the first three foundations of a project, and the first installation represented by each modeling scenario used. If levels measured in any SFV (Thorough or Abbreviated) imply the exceedance of agency-identified ranges to regulatory thresholds, the lessee must take mitigative actions in consultation with the federal permitting agencies. The lessee must submit an SFV plan for review, which, among other things, should include approximations of the expected variation of key parameters (e.g., difficulty to drive, predicted number of necessary strikes, foundation type, pile size, installation method, hammer energy rating, water depth, seabed composition, and season) across the project and an estimate of how many thorough monitoring locations will be required to cover this variability (MUL-29).
- Using sound field measurements to verify or adjust monitored impact zones and protected species observer (PSO) coverage (MMST-3, MMST-5).

Collection of baseline information to better anticipate potential impacts and further mitigate effects on marine mammals in the future includes:

- Conducting long-term PAM or contribute to a research fund to support PAM on the lease area for 1 year before construction through at least 3 years but no more than 10 years of operations (MM-3).
- Archiving SFV data (MUL-29).

A final point to make about the identification of AMMM measures and RPs is that the NARW is the species of greatest concern. Therefore, many AMMM measures and RPs are designed specifically in consideration of the NARW and, in certain circumstances, may increase risk to other species (e.g., seasonal construction window). In other instances, AMMM measures and RPs provide similar benefits to other species. Table J-5 lists the noise-related AMMM measures and RPs for the NY Bight; for the full details of each measure, see Appendix G, *Mitigation and Monitoring*, of the PEIS.

Table J-5. Noise AMMM measures and RPs for the NY Bight

Measure ID	Measure	Discussed in this Analysis	AMMM or RP	Previously Applied?
MM-1	Reporting of all NARW detections	--	AMMM	Yes
MM-2	Real-time PAM monitoring and alert system for baleen whales	Yes	RP	--
MM-3	Long-term PAM monitoring	Yes	AMMM	Yes
MMST-1	Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan	Yes	AMMM	Yes
MMST-2	Marine Mammal and Sea Turtle Monitoring Plan for Pile-Driving	Yes	AMMM	Yes
MMST-3	Pile-driving clearance and shutdown zone adjustments	Yes	AMMM	Yes
MMST-4	Establishment of foundation pile-driving measures	Yes	AMMM	Yes
MMST-5	PSO coverage of expanded pile-driving clearance/shutdown zones	Yes	AMMM	Yes
MMST-6	Pile-driving visibility requirements	Yes	AMMM	Yes
MMST-7	PSO coverage and training requirements for pile-driving	--	AMMM	Yes
MMST-10	Reporting of ESA-Listed Species within Shutdown Zone During Active Pile Driving	--	AMMM	Yes
MMST-12	Marine mammal and sea turtle geophysical survey clearance and shutdown zones and mitigations	Yes	AMMM	Yes
MUL-5	Low noise best practices	Yes	RP	--
MUL-6	Low noise foundations	Yes	RP	--
MUL-7	Vessel noise reduction guidelines	Yes	RP	--
MUL-20	Soft start for impact pile-driving	Yes	AMMM	Yes
MUL-22	Received Sound Level Limit (RSLL)	Yes	AMMM	No
MUL-29	Sound Field Verification (SFV) Process, Plan and Reporting	Yes	AMMM	Yes
MUL-32	Weekly, monthly, and final PSO reporting requirements (including foundation pile-driving)	--	AMMM	Yes
MUL-34	Detected or impacted protected species reporting	--	AMMM	Yes

J.4.8 Discussion of Acoustic Impacts Under Alternative C

Under Alternative C there are two sub-alternatives:

- Sub-alternative C1 (Preferred Alternative), Previously Applied AMMM Measures.
- Sub-alternative C2, Previously Applied and Not Previously Applied AMMM Measures.

In addition to the AMMM measures identified under each sub-alternative, BOEM is recommending lessees consider analyzing the RPs in Table G-2 in Appendix G. For completeness, the acoustic impacts associated with the implementation of the RPs are also discussed here.

Under both sub-alternatives, pile-driving would be expected to contribute the greatest to potential effects on marine mammals associated with noise. However, there are several ways it would differ from Alternative B due to the AMMM measures. With the AMMM measures in Sub-alternative C1 or Sub-alternative C2, the spatial extent of noise associated with pile-driving in the NY Bight would be reduced with respect to Alternative B. In addition, the temporal overlap of construction activities with times when the NARW are present would be avoided to the extent possible. Procedures would be in place such that if animals came into the area in which noise effects may occur, the area would be monitored both visually and acoustically such that any marine mammal in the area should be detected. Procedures would be in place such that if an animal was detected pile-driving would stop, if safe to do so, until the animal(s) left the area. These issues and any differences between Sub-alternative C1 and C2 are further discussed in the sections that follow.

J.4.8.1 Impacts of Noise AMMM Measures

Exposure Time

Under both Sub-alternative C1 and Sub-alternative C2, there are four ways in which exposure time is reduced. These are related to the timing of pile-driving activity: (1) a seasonal restriction on pile-driving between January 1 and April 30 (covered under MMST-4), (2) a time-of-day restriction to daylight hours (covered under MMST-4), (3) a requirement for an alternative monitoring plan if construction were to occur outside daylight hours (MMST-1), and (4) low visibility condition requirements for pile-driving (MMST-6). With the implementation of a seasonal construction restriction, pile-driving would not be allowed to occur during periods when the NARW have historically been present in relatively higher numbers in the NY Bight/southern New England ecoregion (i.e., January 1–April 30) and further would not be allowed to occur in December unless a developer requests and is approved to do so. Exposure to pile-driving for the NARW would be minimized due to this seasonal restriction. This seasonal restriction would likely benefit other species with a similar phenology, or seasonal occurrence, as the NARW, such as harbor porpoise and seals. However, it may be less beneficial to species that may be present in higher numbers when construction is allowed, such as humpback whales, dolphins (Figure J-5), and other species not examined as part of this work. The benefit of a time-of-day restriction is that observers can visually monitor the area around pile-driving activity for marine mammals reliably. With additional low visibility and night-time monitoring requirements, enhanced monitoring (such as the use of technology to aid or supplement visual monitoring) would increase the likelihood of detecting marine life in the area. If pile-driving occurs only in daylight hours, this effectively means there is a period of time, i.e., during the night, when no pile-driving noise is produced. This measure may provide periods of time when animals that are present could recover from auditory fatigue or use the area in ways that they were unable to when construction noise was present. One advantage of pile-driving at any time of the day is that construction could be condensed to periods when animals are not present or in low abundance, effectively reducing the time that construction would occur when animals are present or in higher abundance. The risk assessment framework provides a tool for exploring such scenarios, as the value of either approach will depend on the specific context under consideration (i.e., species of interest, construction location, etc.). Additional modifications could also be made to fine-tune the construction window and further reduce potential exposure to the NARW and other species of interest by using the relative risk assessment framework.

Exposure Area

There are four identified AMMM measures and RPs related to the spatial extent of noise exposure: (1) use of low noise foundations and/or the best available quieting technology (MUL-6); (2) received sound level limit to keep noise levels that exceed the injury threshold for LFC to within a fixed distance from a foundation (MUL-22); (3) adherence to the IMO Guidelines for vessel quieting, where practicable (MUL-7); and (4) soft start for pile-driving (MUL-20).

With MUL-6, the spatial extent of noise associated with pile-driving could be reduced with the use of foundation types other than impact-pile-driven monopiles, such as gravity-base, suction buckets, and other designs that do not require pile-driving. There are different noises associated with the installation of other foundation types; however, they are generally not as loud or as impulsive as impact pile-driving. If the use of non-pile-driving foundations was not possible, the best available quieting technology should be applied. The New England case study simulated the effect of noise mitigation technology on impact pile-driving by reducing the behavioral effect ranges from 20 km and 10 km to 15 km and 5 km for harbor porpoise and other marine mammals, respectively. This reduction is a reasonable expectation of the order of magnitude that noise mitigation could help to reduce the spatial exposure extent of noise under Alternative C. Adherence to the IMO Guidelines on vessel quieting may lead to decreases in vessel noise, which would decrease the risk of masking associated with vessel noise to marine mammals in the area. A final AMMM measure that may have benefits to marine life is the requirement for a soft start during pile-driving (MUL-20). The purpose of this AMMM measure is to capitalize on a potential avoidance response of some marine life by requiring that pile-driving begin at reduced power and strike rate (i.e., fewer strikes per time period) to elicit an avoidance response of any animals in the area before the sound reaches potentially impactful levels. There is no clear evidence for the effectiveness of this mitigation.

In addition to the previously mentioned measures, Sub-alternative C2 would require a received sound level limit (MUL-22). MUL-22 would further limit the spatial extent of sound exposure around impact pile-driving. This AMMM measure was designed to ensure that injurious sound levels to LFC may only occur within a short and fixed distance from the pile-driving source such that the area can be sufficiently monitored for marine mammals. Although this AMMM measure would likely result in decreased noise exposure to all species, it prioritizes LFC. Therefore, it may have greater benefits to those species in comparison to others if, for example, the target was achieved by focusing only on a reduction of the lowest frequencies of pile-driving sound. Reaching the RSLL could be achieved in several ways, including the application of various noise mitigations or the installation of low noise foundations.

Other Potential Reductions in Impacts on Marine Mammals

Several of the other AMMM measures in place in Sub-alternatives C1 and C2 provide opportunities to detect marine mammals or sea turtles during construction and other development activity. With increased opportunities to detect marine mammals, there would be more opportunities to mitigate potential impacts should they arise.

For example, clearance and exclusion zones would be monitored visually and acoustically with real-time PAM during pile-driving (covered under MMST-2, MMST-4). If a marine mammal is detected in those zones, procedures would be triggered to cease pile-driving, to the extent practicable, thereby avoiding a potential exposure that could cause injury or behavioral disturbance to an animal. Clearance and exclusion zones also would be visually monitored during HRG surveys for marine mammals and sea turtles, allowing for a potential exposure to be avoided by shutting down the activity should a marine mammal be present (MMST-12).

Several other monitoring AMMM measures and RPs could directly or indirectly lead to reduced impacts on marine mammals by updating our baseline understanding of marine mammals and potential noise impacts. For example, through long-term PAM monitoring (MM-3), information about marine mammal presence, density, and phenology can be obtained, which can be used to update AMMM measures like the seasonal restrictions. However, under MM-3, data is likely to be collected on a yearly basis, and it is unclear how quickly, or even if, that information could be incorporated into the same project from which the data was collected. The data collected during sound field verification (MUL-29) may be used to adjust a project's shutdown, clearance, and monitoring zones if the sound field differs from what was authorized (MMST-3). In addition, sound field data may also be archived to inform the development of AMMM measures for subsequent projects.

Sound field verification AMMM measures (MUL-29) would not directly change the impact of noise on marine mammals, but the information collected during sound field verification would inform regulators whether the sound produced is within the allowable limits. If not, two AMMM measures (MMST-3 and MMST-5) are in place to ensure adequate monitoring of the area for marine mammals should they be present during construction. MMST-3 would allow for the adjustment of the monitored impact zones based on the sound field measurements, and MMST-5 would modify the number of visual observers based on the adjusted monitoring impact zones. These measures would ensure that any assumptions made in setting up the initial monitoring zones are met, and, if not, modifications are made to ensure adequate monitoring for marine mammals.

If MM-2 (RP) was implemented, real-time PAM would be conducted near any other concentrated development activities, such as laying cables or near a designated transit corridor. Any detections would be communicated to operators on the water. Although this measure would lead to increased opportunities to detect marine mammals in the area and increase operator vigilance of their presence, there is no mitigation directly tied to this AMMM measure. Therefore, any benefits would be indirect, such as if a vessel operator was able to use the detection to identify a marine mammal that it might otherwise have not visually observed. In this case, other AMMM measures are in place that would require the operator to avoid the marine mammal.

The preceding discussion applies to the build-out of one or six projects. The sections that follow provide additional information specifically about these build-outs. However, without an understanding of many of the construction specifics of the NY Bight projects, it is difficult to predict the spatio-temporal impact of the build-out of one or six projects. Consequently, the discussions that follow are only illustrations of potential impacts and should not be considered as the only possibilities. Until more details are known, these should only be considered as hypothetical.

J.4.8.2 Build-out of One Project

Exposure Area

Under RP MUL-5, operators are encouraged to use equipment, technology, and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment. With the implementation of noise mitigation technology, a project would reduce the area exposed to noise. For example, under the mitigated pile-driving scenarios in the New England case study, the behavioral impact radius was 5 km, or a 79-km^2 area, around a pile during a single impact pile-driving event. This dimension would equate to an area 45.4% of the size of the smallest NY Bight lease area (i.e., 174 km^2) or 15.5% of the size of the largest NY Bight lease area (i.e., 510 km^2).

With MUL-22, a physical distance limit to injurious sound levels to LFC would be in place. A received level limit at 1 km around a pile would equate to an area 3.14 km^2 (i.e., 1.8% the smallest NY Bight lease area or 0.62% of the largest NY Bight lease area) ensonified by noise exceeding the LFC acoustic injury threshold.

J.4.8.3 Build-out of Six Projects

Exposure Area

Under Alternative C, if pile-driving occurred on a single lease site at a time, the space exposed during pile-driving would not differ from the build-out of one project. If pile-driving occurred simultaneously on each of the six leases with no overlapping spatial exposure and RP MUL-5 is implemented with the use of noise mitigating technology, a reduced area of exposure—as in the New England case study—could be achieved. As an example from the case study, a 5-km radius of exposure around each pile-driving event for potentially behavioral impactful sound levels would equate to an area equivalent to 471 km^2 (or 24% of the total leased NY Bight area). Under Sub-alternative C2. MUL-22 and a 1-km radius for injury levels for LFC would equate to an 18-km^2 (or 0.95% of the total leased NY Bight area) area exposed to potentially behavioral impactful sound levels.

J.4.8.4 Conclusion

The AMMM measures and RPs identified in this analysis serve key functions in reducing noise impacts. The AMMM measures focused on reducing the spatio-temporal overlap of noise with marine life may have the greatest potential to reduce impacts. However, these AMMM measures and RPs are built on a foundation of knowledge that would not be possible without continued environmental monitoring to understand where and when animals are present and to characterize the sound fields associated with noise-generating activities. Therefore, the monitoring AMMM measures and RPs are also critical in ensuring that the spatio-temporal AMMM measures are most effective and are based on the best available and current information.

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K.5 Chapter 4, Other Required Impact Analysis

None.

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Appendix L: Glossary

L.1 Glossary

Term	Definition
affected environment	Environment as it exists today that could be potentially affected by the Proposed Action or other action alternatives
algal blooms	Rapid growth of the population of algae, also known as *algae bloom*
allision	A moving ship running into a stationary ship
Avoidance, Minimization, Mitigation, and Monitoring measures	The programmatic avoidance, minimization, mitigation, and monitoring (AMMM) measures
anthropogenic	Generated by human activity
archaeological resource	Historical place, site, building, shipwreck, or other archaeological site
below grade	Below ground level
benthic	Related to the bottom of a body of water
benthic resources	The seafloor surface, the substrate itself, and the communities of bottom-dwelling organisms that live on and within these habitats
biogenic habitat	Benthic habitats created by structure-forming species (e.g., eelgrass, mussel beds, worm tubes)
Cetacea	Order of aquatic mammals made up of whales, dolphins, and porpoises
coastal habitat	Coastal areas where flora and fauna live, including salt marshes and aquatic habitats
coastal waters	Waters in nearshore areas where bottom depth is less than 98.4 feet (30 meters)
coastal zone	The lands and waters starting at 3 nautical miles (5.6 kilometers) from the land and ending at the first major land transportation route
commercial fisheries	Areas or entities raising and catching fish for commercial profit
commercial-scale wind energy facility	Wind energy facility usually greater than 1 megawatt (MW) that sells the produced electricity
concrete mattress	Concrete mat used to protect underwater pipelines or stabilize soil or the seabed; can be formed underwater by divers rolling out geosynthetic mattress fabric, zipping it together, and using a pump to fill it with highly fluid small aggregate concrete
criteria pollutant	One of six common air pollutants for which the United States Environmental Protection Agency sets National Ambient Air Quality Standards: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, or sulfur dioxide
critical habitat	Geographic area containing features essential to the conservation of threatened or endangered species
cultural resource	Historical districts, objects, places, sites, buildings, shipwrecks, and archaeological sites on the American landscape, as well as sites of traditional, religious, or cultural significance to cultural groups, including Native American Tribes
culvert	Structure, usually a tunnel, allowing water to flow under an obstruction (e.g., road, trail)
deflagration	Combustion of an explosive at subsonic speeds, driven by transfer of heat
demersal	Living close to the ocean floor
demosponge	Class of sponges that account for more than 90% of all sponges alive, including bath, boring, barrel, carnivorous, and freshwater sponges

Term	Definition
dredging	Removal of sediments and debris from the bottom of lakes, rivers, harbors, and other waterbodies
duct bank	Underground structure that houses the onshore export cables, which consists of polyvinyl chloride pipes encased in concrete
ecosystem	Community of interacting living organisms and nonliving components (such as air, water, soil)
electromagnetic field	A field of force produced by electrically charged objects and containing both electric and magnetic components
embayment	Recessed part of a shoreline
endangered species	A species that is in danger of extinction in all or a significant portion of its range
Endangered Species Act–listed species	Species listed under the Endangered Species Act (ESA) of 1973 (as amended)
ensonification	The process of filling with sound
environmental protection measure	Measure proposed to avoid or minimize potential impacts
environmental consequences	The potential direct, indirect, and cumulative impacts that the construction, operations and maintenance (O&M), and decommissioning of a proposed project would have on the environment
Communities with environmental justice concerns	Minority and low-income populations potentially affected by a proposed project, as defined by both federal and applicable state criteria
epifauna	Fauna that lives on the surface of a seabed (or riverbed), or is attached to underwater objects or aquatic plants or animals
essential fish habitat	"Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (50 Code of Federal Regulations [CFR] part 600)
export cable	Cable connecting the offshore wind facility to the onshore electrical grid power
export cable corridor	Area identified for routing the entire length of the onshore and offshore export cables
federal aids to navigation	Visual references operated and maintained by the United States Coast Guard (USCG), including radar transponders, lights, sound signals, buoys, and lighthouses, that support safe maritime navigation
finfish	Vertebrate and cartilaginous fish species, not including crustaceans, cephalopods, or other mollusks
for-hire commercial fishing	Commercial fishing on a for-hire vessel (i.e., a vessel on which the passengers contribute to a person having an interest in the vessel in exchange for carriage)
for-hire recreational fishing	Fishing from a vessel carrying a passenger for hire who is engaged in recreational fishing
foundation	The bases to which the wind turbine generators (WTGs) and offshore substations (OSSs) are installed on the seabed; seven types of foundations are considered in the RPDE: monopile, piled jacket, suction mono-bucket, suction bucket jacket, tri-suction pile caisson, and gravity-based
frond mattress	Anti-scour protection consisting of aerated polyethylene fronds that when installed on the seabed will naturally float to resemble natural seaweed; as local currents transport sediment through the frond mattress strands encouraging sand, silt, or soil to be deposited onto the mattress, the frond mattress forms a natural fiber reinforced sand bank to protect the area in question
geomagnetic	Relating to the magnetism of the Earth

Term	Definition
gravity-based structure	Typically constructed of steel, concrete, or a combination of both; gravity-based structures sit on top of the seafloor and are not pile driven
hard-bottom habitat	Benthic habitats composed of hard-bottom (e.g., cobble, rock, and ledge) substrates
historic property	As defined in 36 CFR 800.16(l)(1), a prehistoric or historic district, site, building, structure, or object that is eligible for or already listed in the National Register of Historic Places (NRHP); also includes any artifacts, records, and remains (surface or subsurface) related to and located within such a resource
historical resource	There is no common or consistent legal definition for a historic resource; therefore, it is defined the same as an historic property; a prehistoric or historic district, site, building, structure, or object that is eligible for or already listed in the NRHP; also includes any artifacts, records, and remains (surface or subsurface) related to and located within such a resource
horizontal directional drilling	Trenchless technique for installing underground cables, pipes, and conduits using a surface-launched drilling rig
hull	Watertight frame or body of a ship
infauna	Fauna living in the sediments of the ocean floor (or river or lake beds)
interarray cables	Cables connecting the wind turbine generators to the electrical service platforms
Interdunal	Habitat between dunes
invertebrate	Animal with no backbone
jacket foundation	Latticed steel frame with three or four supporting piles driven into the seabed
jack-up vessel	Mobile and self-elevating platform with buoyant hull
jet excavation	Process of moving or removing soil with a jet
jet plowing	Plowing in which the jet plow, with an adjustable blade, or plow, rests on the seafloor and is towed by a surface vessel; the jet plow creates a narrow trench at the designated depth, while water jets fluidize the sediment within the trench
knot	Unit of speed equaling 1 nautical mile (1.8 kilometer) per hour
landfall site	The shoreline landing site at which the offshore cable transitions to onshore
marine mammal	Aquatic vertebrate distinguished by the presence of mammary glands, hair, three middle ear bones, and a neocortex (a region of the brain)
marine waters	Waters in offshore areas where bottom depth is more than 98.4 feet (30 meters)
mechanical cutter	Method of submarine cable installation equipment that involves a cutting wheel or excavation chain to cut a narrow trench into the seabed allowing the cable to sink under its own weight or be pushed to the bottom of the trench via a cable depressor
mechanical plow	Method of submarine cable installation equipment that involves pulling a plow along the cable route to lay and bury the cable; the plow's share cuts into the soil, opening a temporary trench, which is held open by the side walls of the share, while the cable is lowered to the base of the trench via a depressor; some plows may use additional jets to fluidize the soil in front of the share
metocean	The syllabic abbreviation of meteorology and oceanography; a metocean study is used to estimate the environmental conditions including the wind, wave, and climate conditions found at a certain location
monopile or monopile foundation	A long steel tube driven into the seabed that supports a tower
mooring dolphin	Isolated marine structure used for mooring and securing vessels near pier structures to control the transverse movement of vessels while docked
nautical mile	A unit used to measure sea distances and equivalent to approximately 1.15 miles (1.85 kilometers)

Term	Definition
NY Bight area	The New York Bight (NY Bight) is the geological identification applied to the roughly triangular indentation, regarded as a bight, along the Atlantic coast of the United States that extends northeasterly from Cape May Inlet in New Jersey to Montauk Point on the eastern tip of Long Island
NY Bight lease areas	Commercial Lease Areas OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544
NY Bight projects	Hypothetical projects that may be proposed within the six NY Bight lease areas
offshore project area	The offshore components that collectively make up the NY Bight offshore project area include the lease areas, WTGs, OSSs, scour protection for foundations, interarray and substation interconnection cables, and offshore export cables
offshore substation	The interconnection point between the WTGs and the export cable; the necessary electrical equipment needed to connect the interarray cables to the offshore export cables
onshore project area	The onshore components that collectively make up the NY Bight onshore project area include the landfall sites, the sea-to-shore transition that connects the offshore export cables to the onshore export cables, onshore export cable routes to onshore substations or converter stations, and the connection from the onshore substations or converter stations to the existing grid
onshore substation	Substation connecting a project to the existing bulk power grid system
operations and maintenance facilities	Would include offices, control rooms, warehouses, shop space, and pier space
Outer Continental Shelf	All submerged land, subsoil, and seabed belonging to the United States but outside of states' jurisdiction
permanent threshold shift	Affecting animals as a result of sound exposure, permanent threshold shift or PTS is an irreversible loss of hearing due to hair cell loss or other structural damage to auditory tissues
pile	A type of foundation akin to a pole
pile-driving	Installing foundation piles by driving them into the seafloor
pinnipeds	Carnivorous, semiaquatic marine mammals with fins, also known as seals
pin pile	Small-diameter pipe driven into the ground as foundation support
plume	Column of fluid moving through another fluid
private aids to navigation	Visual references on structures positioned in or near navigable waters of the United States, including radar transponders, lights, sound signals, buoys, and lighthouses, that support safe maritime navigation; permits for the aids are administered by USCG
Proposed Action	Specifically Alternative C, is the identification of AMMM measures such that the potential impacts described in Alternative B may be avoided, reduced, or mitigated
Preferred Alternative	Specifically Sub-alternative C1, Previously Applied AMMM Measures, analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in Construction and Operations Plans submitted for the Atlantic Outer Continental Shelf or through related consultations.
protected species	Endangered or threatened species that receive federal protection under the ESA of 1973 (as amended)
quay	Concrete, stone, or metal platform lying alongside or projecting into water for loading and unloading ships
Representative Project Design Envelope (RPDE)	The range of technical parameters that describe a wind energy project that could occur within the NY Bight lease areas

Term	Definition
rock bags	Bags constructed of mesh material filled with rock or rip rap, making it a flexible protection system for marine construction work
scour protection	Protection consisting of rock and stone that would be placed around all foundations to stabilize the seabed near the foundations as well as the foundations themselves
scrublands	Plant community dominated by shrubs and often also including grasses and herbs
seabed spacer	An underwater cable system designed to hold and protect cables
sessile	Attached directly by the base
silt substrate	Substrate made of a granular material originating from quartz and feldspar, and whose size is between sand and clay
soft-bottom habitat	Benthic habitats that include soft-bottom (i.e., unconsolidated sediments) and hard-bottom (e.g., cobble, rock, ledge) substrates, as well as biogenic habitat (e.g., eelgrass, mussel beds, worm tubes) created by structure-forming species.
spud barge	Sometimes called a jack-up barge, a spud barge is a specialized type of barge commonly used for marine construction operations; the barge is moored by steel shafts or through-deck piling, which are essentially pipes driven right into the soil or sand at the bottom of the water to provide stability
substrate	Earthy material at the bottom of a marine habitat; the natural environment that an organism lives in
suction-bucket jacket	Latticed steel frame with three to four supporting suction-bucket foundations securing the structure to the seabed
suspended sediments	Very fine particles that remain in suspension in water for a considerable period of time without contact with the bottom; such material remains in suspension due to the upward components of turbulence and currents, or by suspension
temporary threshold shift	Affecting animals as a result of sound exposure, temporary threshold shift or TTS is a relatively short-term (e.g., within several hours or days), reversible loss of hearing following noise exposure, often resulting from hair cell fatigue
threatened species	A species that is likely to become endangered within the foreseeable future
tidal energy project	Project related to the conversion of the energy of tides into usable energy, usually electricity
tidal flushing	Replacement of water in an estuary or bay because of tidal flow
trawl	A large fishing net dragged by a vessel at the bottom or in the middle of sea or lake water
turbidity	A measure of water clarity
utility right-of-way	Registered easement on private land that allows utility companies to access the utilities or services located in that area
vibracore	Technology/technique for collecting core samples of underwater sediments and wetland soils
viewshed	Area visible from a specific location
visual resource	The visible physical features on a landscape, including natural elements such as topography, landforms, water, vegetation, and anthropogenic structures
wetland	Land saturated with water, and includes marshes and swamps
wind energy	Electricity from naturally occurring wind
wind energy area	Areas with significant wind energy potential and defined by Bureau of Ocean Energy Management (BOEM)
wind turbine generator	Component that puts out electricity in a structure that converts kinetic energy from wind into electricity

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Appendix M: List of Preparers and Reviewers

M.1 List of Preparers and Reviewers

Table M-1. Bureau of Ocean Energy Management contributors

Name	Role/Resource Area
Ajilore, Ololade	Navigation and Vessel Traffic
Arzt, Tamara	Endangered Species Act (ESA) Sections
Aspromonti, Lauren	Representative Project Design Envelope (RPDE)
Honeycutt, Arianna	Navigation and Vessel Traffic
Baker, Kyle	Marine Mammals; Sea Turtles
Beser, Todd	Coastal Habitat and Fauna; Wetlands
Bigger, David	Bats; Birds; Coastal Habitats
Brune, Genevieve	Land Use and Coastal Infrastructure
Bucatari, Jennifer	Other Uses (Marine Minerals)
Chaiken, Emma	Commercial Fisheries and For-Hire Recreational Fishing; Recreation and Tourism
Chaky, Sindey	Environmental Justice; Land Use and Coastal Infrastructure; Recreational Fishing
Cornelison, Meghan	Demographics, Employment, and Economics; Environmental Justice; Scenic and Visual Resources
Davidson, Megan	Deputy Project Manager
Dawson, Elizabeth	Cumulative Impacts
Draher, Jennifer	Water Quality
Ehrhorn, Annette	Other Uses (Military Use)
Fulling, Gregory	Marine Mammals; Sea Turtles
Gange, Joshua	Other Uses (Transmission Lines)
Gentry, Lisa	Navigation and Vessel Traffic
Gallagher, Gwendolyn	AMMM Measures
Hayes, Tyler	Navigation and Vessel Traffic
Hogan, Charissa	Air Quality
Hooker, Brian	Commercial Fisheries and For-Hire Recreational Fishing
Horrell, Christopher	Cultural Resources
Hosch, Peter	RPDE
Houghton, Bonnie	Other Uses (Military Use and Aviation)
Howard, Bernard	Tribal Consultation
Howson, Ursula	Benthic Resources; Coastal Habitats; Commercial Fisheries and For-Hire Recreational Fishing; Finfish, Invertebrates, and Essential Fish Habitat (EFH); Other Uses; Wetlands
Jensen, Brandon	Benthic Resources; Commercial Fisheries and For-Hire Recreational Fishing; Finfish, Invertebrates, and EFH
Jensen, Mark	Demographics, Employment, and Economics; Recreation and Tourism
Jordan, Brian	Cultural Resources
Kates Varghese, Hilary	Acoustics
Lewis, Jo’Anne	Navigation and Vessel Traffic
Mansfield, Laura	Environmental Justice
Martin, Morgan	Acoustics

Name	Role/Resource Area
McCarty, John	Recreation and Tourism; Scenic and Visual Resources
McGuffin, Andrew	Other Uses (Cables and Radars); RPDE
Moshier, Marissa	Cultural Resources
Le, Jennifer	RPDE
O’Connell, Daniel	RPDE
Oliver, Elizabeth	Tribal Consultation
Pollock, Jayson	Commercial Fisheries
Price, Franklin	Cultural Resources
Remsen, Andrew	Water Quality
Renick, Hillary	Tribal Consultation
Richards, Renee	Other Uses (Unexploded Ordnances)
Schnitzer, Laura	Cultural Resources
Sharuga, Stephanie	Water Quality; Wetlands; ESA Sections; Benthic Resources
Slayton, Ian	Air Quality; Cumulative Impacts
Staaterman, Erica	Acoustics
Stokely, Sarah	Cultural Resources
Strain, Courtney	Project Manager
Sullivan, Kimberly	Environmental Justice
Tarbox, Mary Margaret	AMMM Measures
Vishnubhotla, Srinivas	RPDE
Washington, Travis	Water Quality
White, Timothy	Bats; Birds
Wisman, Jeri	Marine Mammals; Sea Turtles
Wolf, Jacob	Air Quality
Wolvovsky, Eric	Air Quality; Cumulative Impacts
Yerkes, Russell	Graphics

Table M-2. Reviewers

Name	Title	Agency
Bureau of Ocean Energy Management (BOEM) and U.S. Department of the Interior (DOI) Reviewers		
Baker, Karen	Chief, Office of Renewable Energy	BOEM
Bosyk, Jennifer	Chief, Branch of Environmental Communication and Coordination	BOEM
Diamond, David	Deputy Chief for Atlantic Operations, Office of Renewable Energy	BOEM
Frank, Wright	Chief, Renewable Energy Policy Group	BOEM
Hildreth, Emily	Policy Analyst	BOEM
Jordan, Brian	Chief, Branch of Environmental Learning and Analysis	BOEM
Landers, Lisa	Chief, NEPA Section	BOEM
Lewandowski, Jill	Chief, Division of Environmental Assessment	BOEM
Sauls, Marilyn	Chief, Engineering and Technical Review Branch	BOEM
Stromberg, Jessica	Chief, Environment Branch for Renewable Energy	BOEM
Meléndez-Arreaga, Pedro	Lead Attorney-Advisor, Office of the Solicitor	DOI
Monroe, Lori	Office of the Solicitor	DOI
Vorkoper, Stephen	Office of the Solicitor	DOI

Name	Title	Agency
Cooperating Tribal Government and Cooperating and Participating Agency Reviewers		
Arzt, Tamara	Supervisory Environmental Protection Specialist	Bureau of Safety and Environmental Enforcement
Kozak, Mark	Mechanical Engineer, Project Lead	Bureau of Safety and Environmental Enforcement
Lan, Christy	Senior Technical Advisor for Renewable Energy	Bureau of Safety and Environmental Enforcement
Martin, Shannon	Ecologist – Protected Species	Bureau of Safety and Environmental Enforcement
Tuttle, Graham	Environmental Protection Specialist	Bureau of Safety and Environmental Enforcement
Hay, Stormy	Deputy Tribal Historic Preservation Officer	Mashantucket Pequot Tribal Nation
Johnson, Michael Kickingbear	Tribal Historic Preservation Officer	Mashantucket Pequot Tribal Nation
Soleau, Tyler	CZM Assistant Director	Massachusetts Office of Coastal Zone Management
Boeri, Robert	Project Review Coordinator	Massachusetts Office of Coastal Zone Management
Andel, Kristin	Northeast Region Energy Specialist	National Park Service
Krueger, Mary	External Energy Coordinator	National Park Service
Bailey, Blair	General Counsel	New Bedford Port Authority
Regan, John	Director	New Bedford Port Authority
Brunatti, Megan	Deputy Chief of Staff	New Jersey Department of Environmental Protection
Lange, Elizabeth	Environmental Specialist 2	New Jersey Department of Environmental Protection
Nolan, Katherine	Team Leader, Renewable Energy and Offshore Wind	New Jersey Department of Environmental Protection
Benjamin, Sharon	NEPA Policy Analyst	National Marine Fisheries Service
Brancart, Kendall	NOAA Affiliate-Offshore Wind, Environmental Specialist	National Marine Fisheries Service
Cardiasmenos, Timothy	NEPA Coordinator, Greater Atlantic Regional Fisheries Office	National Marine Fisheries Service
Crocker, Julie	Chief, ESA Fish, Energy, and Ecosystems Branch	National Marine Fisheries Service
Daly, Jaclyn	MMPA Offshore Wind Team Lead	National Marine Fisheries Service
Pentony, Michael	Regional Administrator	National Marine Fisheries Service
Tuxbury, Susan	Fishery Biologist/Wind Coordinator	National Marine Fisheries Service
Reid, Cristi	NMFS National (Acting) and Headquarters NEPA Coordinator, Office of Policy	National Marine Fisheries Service
Dillon, Kevin	Clean Energy Specialist	New Jersey Board of Public Utilities

Name	Title	Agency
Lawrence, Kira	Senior Policy Advisor	New Jersey Board of Public Utilities
Semel, Hilary	Director and General Counsel	New York City Mayor's Office of Environmental Coordination
Gaidasz, Karen	Project Manager	New York State Department of Environmental Conservation
Hepner, Tyler	Attorney	New York State Department of Environmental Conservation
Haight, Terra	Ocean & Lakes Policy Analyst	New York State Department of State
McLean, Laura	Ocean and Lakes Policy Analyst	New York State Department of State
Bendremer, Jeffrey	Tribal Historic Preservation Officer	Stockbridge-Munsee Community Band of Mohican Indians
Handell, Naomi	Regulatory Program Manager	U.S. Army Corps of Engineers
Pritts, Jared	NEPA Subject Matter Expert	U.S. Army Corps of Engineers
Creelman, Matthew	Marine Transportation Specialist, District 5	U.S. Coast Guard
Desautels, Michele	Maritime Energy and Marine Planning	U.S. Coast Guard
Sheehy, Jennifer	Navigation Standards Division	U.S. Coast Guard
Austin, Mark	Environmental Engineer	U.S. Environmental Protection Agency
Nyer, Samantha	Physical Scientist	U.S. Environmental Protection Agency
Rosenblatt, Anne	Remedial Project Manager	U.S. Environmental Protection Agency
Ciappi, Michael	Senior Fish and Wildlife Biologist	U.S. Fish and Wildlife Service
Drew, Ian	Field Supervisor - New York Field Office	U.S. Fish and Wildlife Service
Ming, Jaron	Branch Chief, Air and Water Resources, National Wildlife Refuge System	U.S. Fish and Wildlife Service
Papa, Steve	Senior Fish and Wildlife Biologist	U.S. Fish and Wildlife Service
Vail-Muse, Stephanie	Regional Energy Coordinator	U.S. Fish and Wildlife Service

Table M-3. Consultants

Name	Role/Resource Area
ICF	
Baer, Sarah	Land Use and Coastal Infrastructure
Birnbaum, David	Cultural Resources
Brown, Sheri	Scenic and Visual Resources
Cherry, Kenneth	Support Editor
Diller, Elizabeth	Program Director
Ernst, David	Air Quality
Hatfield, Teresa	Navigation and Vessel Traffic
Irvin, Elizabeth	Support Editor

Name	Role/Resource Area
Johnson, David	Project Manager; Bats; Birds; Wetlands
Jost, Rebecca	Other Uses
Larsen, Rick	Wetlands
Lassell, Susan	Cultural Resources and Section 106 Lead
Lundstrom, Kristen	Lead Editor
Mahoney, Elisabeth	Deputy Project Manager; Administrative Record; Other Uses
Mountain-Castro, Jenelle	Publications Specialist
Muntz, Alice	Cultural Resources
Olsen, Karin	Programmatic Tiering, Public Involvement
Piggott, Jennifer	Facilitator and Public Involvement Lead
Powell, Drew	Bats; Birds
Read, Brent	Geographic Information Systems
Stoll, Jean	Cultural Resources
Sullivan, Neil	Senior Advisor
CSA Ocean Sciences Inc.	
Barkaszi, Mary Jo	Marine Mammals; Sea Turtles
Cady, Robert	Quality Assurance/Quality Control (QA/QC)
Cahill, Melanie	CSA Project Manager
Gifford, Kathleen	Water Quality
Hartigan, Kayla	Sea Turtles
Martin, Tony	Finfish, Invertebrates, and Essential Fish Habitat
McMahon, Adrianna	Benthic Resources
Stevens, Tara	Marine Mammals
Tiggelaar, John	Commercial Fisheries and For-Hire Recreational Fishing
Ward, Vanessa	Geographic Information Systems
Avanti Corporation	
DaCruz, Amelia	Demographics, Employment, and Economics; Recreation and Tourism
Dempsey, Emma	Demographics, Employment, and Economics; Environmental Justice
Petrazzuolo, Gary	Demographics, Employment, and Economics
Petrazzuolo, Lynn	Demographics, Employment, and Economics; Environmental Justice
Weil, Julia	Environmental Justice

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Appendix N: Distribution List

The Final Programmatic Environmental Impact Statement (PEIS) is available in electronic form for public viewing at https://www.boem.gov/renewable-energy/state-activities/new-york-bight. Hard copies and digital copies of the Final PEIS can be requested by contacting the Bureau of Ocean Energy Management (BOEM), Office of Environmental Programs in Sterling, Virginia at (703) 787-1703. Publication of the Draft PEIS initiated a 45-day comment period where government agencies, Tribal Nations, members of the public, and interested stakeholders could provide comments and input. On February 29, 2024, BOEM announced an extension to the comment period. BOEM accepted comments received or postmarked no later than March 13, 2024, in any of the following ways:

- In hard copy form, delivered by mail, enclosed in an envelope labeled "NY BIGHT PEIS" and addressed to Chief, Division of Environmental Assessment, Office of Environmental Programs, Bureau of Ocean Energy Management, 45600 Woodland Road (VAM-OEP), Sterling, Virginia 20166
- Through the regulations.gov web portal by navigating to https://www.regulations.gov/, searching for docket number "BOEM-2024-0001," and clicking the "Comment" button.
- By attending one of the public meetings at the location and dates listed in the Notice of Availability and providing written or verbal comments.

BOEM used comments received during the public comment period to inform its preparation of the Final PEIS, as appropriate. Notification lists for the PEIS are provided in Tables N-1 through N-4.

N.1 Notification List

Table N-1. Cooperating federal agencies

Agency	Contact
National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)	Michael Pentony, Susan Tuxbury, Julie Crocker, Jaclyn Daly, Cristi Reid, Timothy Cardiasmenos, Keith Hanson, Kendall Brancart
National Park Service (NPS) Region 1	Mary Krueger, Kristin Andel
U.S. Department of the Interior (DOI), Bureau of Safety and Environmental Enforcement (BSEE)	Tamara Arzt, Shannon Martin
U.S. Army Corp of Engineers (USACE)	Naomi Handell, Jared Pritts
U.S. Coast Guard (USCG)	Jennifer Sheehy, Maureen Kallgren, Michele Desautels, Christopher Sparkman, Matthew Creelman, Robert Webb
U.S. Environmental Protection Agency (USEPA) Region 2	Anne Rosenblatt, Mark Austin
U.S. Fish and Wildlife Service (USFWS)	Ian Drew, Jaron Ming, Stephanie Vail-Muse, Steve Papa, Michael Ciappi, Allison Konkowski

Table N-2. Tribal Nations

Tribal Nation	Contact
Absentee-Shawnee Tribe of Indians of Oklahoma	Devon Frazier, Tribal Historic Preservation Officer John Raymond Johnson, Governor
Delaware Tribe of Indians	Susan Bachor, Historic Preservation Representative, Delaware Tribe Historic Preservation Office Brad Kills Crow, Chief
Eastern Shawnee Tribe of Oklahoma	Brett Barnes, Cultural Preservation Director Paul Barton, Tribal Historic Preservation Officer Glenna Wallace, Chief
Mashantucket (Western) Pequot Tribal Nation	Michael Kickingbear Johnson, Tribal Historic Preservation Officer Stormy Hay, Deputy Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe	David Weeden, Tribal Historic Preservation Officer
Mohegan Tribe of Connecticut	James Gessner, Chairman James Quinn, Tribal Historic Preservation Officer
Stockbridge-Munsee Community Band of Mohican Indians	Shannon Holsey, President Jeffrey C. Bendremer, Tribal Historic Preservation Officer
The Delaware Nation	Deborah Dotson, President Katelyn Lucas, Tribal Historic Preservation Officer Carissa Speck, Tribal Historic Preservation Director
The Narragansett Indian Tribe	John Brown, Tribal Historic Preservation Officer Dinalyn Spears, Natural Resources Manager Anthony Dean Stanton, Chief Sachem
The Shinnecock Indian Nation	Bianca Collins, Councilwoman Secretary Jason Cofield, Director of Tribal Operations Lisa Goree, Chairwoman T. Rainbow Chavis, Cultural Resources Director Shavonne Smith, Director Shinnecock Environmental Department Tela Troge, Esquire
Tuscarora Nation	Ton Jonathan, Chief Sachem
Wampanoag Tribe of Gay Head (Aquinnah)	Cheryl Andrews-Maltais, Chairwoman Lael Echo-Hawk, General Counsel Barbara Spain, Executive Assistant Bettina Washington, Tribal Historic Preservation Officer Al Clark, Vice-Chair Kevin Devine, Tribal Councilperson

Table N-3. Cooperating Tribal Governments and state and local agencies

Agency	Contact
Cooperating Tribal Governments	
Stockbridge-Munsee Community Band of Mohican Indians	Jeffrey C. Bendremer, Bonney Hartley
Mashantucket (Western) Pequot Tribal Nation	Michael Kickingbear Johnson, Stormy Hay
Cooperating State and Local Agencies	
Massachusetts Office of Coastal Zone Management	Tyler Soleau, Robert Boeri
New Bedford Port Authority	John Regan, Blair Bailey
New Jersey Board of Public Utilities (NJBPU)	Kevin Dillon, Kira Lawrence
New Jersey Department of Environmental Protection (NJDEP)	Megan Brunatti
New York Department of State (NYSDOS)	Laura McLean, Terra Haight
New York State Department of Environmental Conservation (NYSDEC)	Karen Gaidasz, Tyler Hepner
Participating State and Local Agencies	
New York City (NYC) Mayor's Office	Hilary Semel

Table N-4. Section 106 consulting parties

Organization Type	Organization	Contact
Federally Recognized Tribes	Absentee-Shawnee Tribe of Indians of Oklahoma	Devon Frazier, Tribal Historic Preservation Officer (THPO) John Raymond Johnson, Governor
	Delaware Tribe of Indians	Susan Bachor, Historic Preservation Representative, Delaware Tribe Historic Preservation Office Brad Kills Crow, Chief
	Eastern Shawnee Tribe of Oklahoma	Brett Barnes, Cultural Preservation Director Paul Barton, THPO Glenna Wallace, Chief
	Mashantucket (Western) Pequot Tribal Nation	Michael Kickingbear Johnson, THPO Stormy Hay, Deputy THPO
	Mashpee Wampanoag Tribe	David Weeden, THPO
	Mohegan Tribe of Connecticut	James Gessner, Chairman James Quinn, THPO
	Stockbridge-Munsee Community Band of Mohican Indians	Jeffrey C. Bendremer, THPO
	The Delaware Nation	Deborah Dotson, President Katelyn Lucas, Historic Preservation Assistant Carissa Speck, Tribal Historic Preservation Director
	The Narragansett Indian Tribe	John Brown, THPO Dinalyn Spears, Natural Resources Manager Anthony Dean Stanton, Chief Sachem

Organization Type	Organization	Contact
	The Shinnecock Indian Nation	Bianca Collins, Councilwoman Secretary Jason Cofield, Director of Tribal Operations Lisa Goree, Chairwoman T. Rainbow Chavis, Cultural Resources Director Shavonne Smith, Director Shinnecock Environmental Department Tela Troge, Esquire
	Tuscarora Nation	Tom Jonathan, Chief Sachem
	Wampanoag Tribe of Gay Head (Aquinnah)	Cheryl Andrews-Maltais, Chairwoman Lael Echo-Hawk, General Counsel Barbara Spain, Executive Assistant Bettina Washington, THPO Al Clark, Vice-Chair Kevin Devine, Tribal Councilperson
Federal Government	U.S. Advisory Council on Historic Preservation	Christopher Daniel, Federal Property Management Section, Program Analyst Chris Koeppel, Federal Property Management Section, Assistant Director
	U.S. Army Corps of Engineers	Naomi Handell, Regulatory Program Manager, Operations and Regulatory Division, USACE North Atlantic Division Jared Pritts, NEPA Subject Matter Expert, Technical Regional Execution Center, USACE North Atlantic Division
	U.S. Bureau of Safety and Environmental Enforcement	W. Shawn Arnold, Federal Preservation Officer/Senior Marine Archaeologist Daniel "Herb" Leedy, Supervisory Biologist
	U.S. Environmental Protection Agency	Mark Austin, Team Leader, Environmental Reviews
	U.S. National Park Service	Mary Krueger, Region 1 Energy Specialist Kirstin Andel, Region 1 Energy Specialist
Local Government	Atlantic County	Frances Brown, Principal Planner Gerald DelRosso, County Administrator Ranae Fehr, Department Head / Director of Planning and Engineering
	Avon-by-the-Sea Borough	Ed Bonanno, Mayor Anna Bongiorno, Acting Municipal Clerk
	Borough of Beach Haven	Catherine Snyder, Council President Jaime Baumiller, Councilwoman Robert Stern, Resident
	Borough of Highlands	Karen Chelak, Councilmember Donald Melnyk, Councilmember
	Borough of Point Pleasant Beach	Paul Kanitra, Mayor Kristen O'Rourke, Quality of Life Director
	Borough of Sea Bright	Brian Kelly, Mayor
	Borough of Seaside Park	Sandy Martin, Clerk John Peterson Jr., Mayor
	Borough of Spring Lake	Bryan Dempsey, Borough Administrator Jennifer Naughton, Mayor

Organization Type	Organization	Contact
	Cape May County	Rita M. Rothberg, Cape May County Clerk, Adjuster and County Historian
	City of Absecon	Carie Crone, City Clerk Kim Horton, Mayor
	City of Asbury Park	Jason D. Harzold, Client Manager, T and M Associates
	City of Hoboken	Ravi Bhalla, Mayor Christopher A. Brown, Community Development/Planning Director James J. Farina, City Clerk
	City of North Wildwood	Patrick Rosenello, Mayor
	Monmouth County	Joseph Barris, Planning Director David Schmetterer, Assistant Planning Director
	Monmouth County Park System	Paul Gleitz, Principal Park Planner Gail Hunton, Chief, Acquisition & Design Department Anna Luiten, Environmental Specialist
	Nassau County	Kenneth Arnold, Commissioner of Public Works
	Neptune City	Brian Thomas, Councilman
	Suffolk County	Lisa Broughton, Energy Director
	Town of Babylon	Rachel Scelfo, Commissioner, Office of Planning and Development
	Town of Islip	James C. Brennan, Deputy Commissioner, Planning & Development Ela Dokonal, Commissioner, Planning & Development
	Town of Oyster Bay	George Baptista, Jr., Deputy Commissioner Julia Schneider, Director of TEQR
	Township of Brick	Keith Rella, Public Information/Administration
	Township of Hamilton	Erin Crean, Director of Community Development Joseph Kostecki, Township Administrator
	Township of Middletown	Tony Perry, Mayor
	Township of Stafford	Matthew von der Hayden, Township Administrator/Director of Water & Sewer Utility
	Village of Bellport	Mary Pontieri, Clerk
	Village of Patchogue	Lori B. Devlin, Village Clerk Dennis Smith, Assistant to the Mayor
Other Potentially Interested Parties	Green-Wood Cemetery	Joseph Charap, Vice President of Horticulture Richard Moylan, President
	Hempstead Harbor Protection Committee	Eric Swenson, Executive Director
	Point O'Woods Association	William Cook, Special Counsel
Preservation Organization	Bay Shore Historical Society	Barry Dlouhy, President
	Greater Cape May Historical Society	Harry Bellangy, President and Historian Kathleen Wyatt, Administrator and Secretary
	Historic Districts Council	Lucie Levine, Preservation Advocacy and Community Outreach Manager Diego Robayo, Public Relations Specialist Frampton Tolbert, Executive Director

Organization Type	Organization	Contact
	Historical Society of Highlands	Rita Moles, Secretary Shelia Weinstock, President
	Ocean City Historical Museum	John Loeper, President
	Preservation Alliance of Spring Lake	Joseph Rizzo, President
	Romer Shoal Light	Keith Kilgannon, President
	Save Long Island Beach Inc.	Robert Stern, President
	The Noyes Museum of Art	Michael Cagno, Executive Director
	West Bank Lighthouse	Keith Kilgannon, President
State Government	New Jersey State Museum	Nicole Jannotte, Executive Director
	New York State Parks, Recreation & Historic Preservation, Long Island State Parks Region 9	Jill Dietrich, Liaison George Gorman, Jr., Regional Director
	New York State Parks, Recreation and Historic Preservation	Erik Kulleseid, Commissioner
State Government (SHPO)	New Jersey Department of Environmental Protection, Historic Preservation Office	Meghan Baratta, Supervising Historic Preservation Specialist Jennifer Leynes, Historic Preservation Specialist 2 Katherine Marcopul, Deputy State Historic Preservation Officer Jesse West-Rosenthal, Historic Preservation Specialist 2
	New York State Historic Preservation Office	Nancy Herter, Director, Technical Preservation Services Bureau Tim Lloyd, PhD, Archaeologist Daniel Mackay, Deputy Commissioner for Historic Preservation
State Recognized Tribe	Lenape Indian Tribe of Delaware	Dennis J. Coker, Principal Chief
Lessee	Atlantic Shores Offshore Wind Bight (OCS-A 0541)	Jennifer Daniels, Tribal Liaison Officer, Development Director Vince Esposito, Permitting Lead Megan Hayes, Senior Permitting Lead
	Attentive Energy (OCS-A 0538)	Isabel Kaubisch, Permitting Program Manager Laura Klewicki, Federal Permitting Specialist Lauren Cleeland, Tribal Liaison Officer
	Invenergy (OCS-A 0542)	Carmen Bernett, Senior Manager, Environmental Compliance and Strategy Hope E. Luhman, PhD, RPA, Tribal Liaison Officer Shannon Stewart, Director, Environmental Compliance and Strategy
	Bluepoint Wind (OCS-A 0537)	Kori Ktona Barnes, Federal Permitting Manager Michael Brown, Country Manager North America John Dempsey, Chief Executive Officer Lia Howard, Head of Permitting

Organization Type	Organization	Contact
	Community Offshore Wind (OCS-A 0539)	Katherine Miller, Federal Permitting Project Manager Daniel Sieger, Head of Development Justin Bedard, Tribal Liaison Officer
	Vineyard Mid-Atlantic (OCS-A 0544)	Geri Edens, Director of Permitting Laura George, Permitting Manager Nate Mayo, Tribal Liaison Officer, Public Affairs Director Esther Siskind, Federal Permitting Lead Jacob Miller, Tribal Lead

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Appendix O: Scoping Report

Contents

Abbreviations and Acronyms

Acronym	Definition
AMMM	avoidance, minimization, mitigation, and monitoring
BOEM	Bureau of Ocean Energy Management
CEHA	Coastal Erosion Hazard Areas
COP	Construction and Operations Plan
CZMA	Coastal Zone Management Act
DACs	disadvantaged communities
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EMF	electromagnetic field
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
GW	gigawatts
HDD	Horizontal Directional Drilling
IOOS	Integrated Ocean Observing System
MMPA	Marine Mammal Protection Act
NAAQS	National Ambient Air Quality Standards
NCCOS	National Centers for Coastal Ocean Science
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NJDEP	New Jersey Department of Environmental Protection
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NY Bight	New York Bight
NYS	New York State
NYS OPRHP	New York State's Office of Parks, Recreation and Historic Preservation
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York Department of State
NYSDOT	New York State Department of Transportation
NYSDPS	New York State Department of Public Service
NYSERDA	New York State Energy Research & Development Authority
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
PA	Programmatic Agreement
PAM	Passive Acoustic Monitoring
PEIS	Programmatic Environmental Impact Statement
PLAs	project labor agreements
ppm	parts per million
RMI	Research and Monitoring Initiative
ROW	right-of-way
RPDE	representative project design envelope
RWSC	Regional Wildlife Science Collaborative for Offshore Wind
SAV	submerged aquatic vegetation

Acronym	Definition
SCFWF	Significant Coastal Fish and Wildlife Habitats
SHPOs	State Historic Preservation Officers
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	Vessel Monitoring Systems
WEA	Wind Energy Area
WSR	Wild, Scenic, & Recreational Rivers
WTG	Wind Turbine Generator

O.1 Introduction

On July 15, 2022, the Bureau of Ocean Energy Management (BOEM) published a Notice of Intent (NOI) to prepare the New York Bight (NY Bight) Programmatic Environmental Impact Statement (PEIS), which will analyze potential impacts from wind energy development activities in the NY Bight region. The initial 30-day public comment period opened on July 15, 2022. The period was extended to August 30, 2022. Public input was collected via regulations.gov (docket BOEM-2022-0034). Through October 7, 2022, BOEM received a total of 43 comments, all of which were unique.

The comments came from a variety of stakeholders including federal, State, non-governmental associations, and individual commenters. This report indicates the commenters that made particular arguments, as represented by footnotes following summary statements. The footnotes include the names of individuals and organizations. The footnotes following summary statements provide representative examples of commenters providing particular arguments, and are not meant to be exhaustive of each commenter providing a similar argument.

Public comments were analyzed using the CommentWorks® software product. As a first step, comments submitted to regulations.gov and received via email were downloaded and processed to be imported into CommentWorks. A hierarchical outline was developed to include key issues provided by BOEM staff. Analysts reviewed the comment letters, identifying the substantive excerpts within each submission ("bracketing"), and used the issue outline to associate each excerpt to the issue(s) to which it applies ("coding"). The comments were then summarized by issue as presented in this report. The full text of all public scoping comments received can be viewed online at http://www.regulations.gov by typing "BOEM-2022-0034" in the search field.

Table O-1 lists the commenters.

Table O-1. Index of comment submissions sorted by submission number

Submission ID	Commenter	Commenter Type
BOEM-2022-0034-0002	James Binder	Individual
BOEM-2022-0034-0003	Jeffrey Tyler	Individual
BOEM-2022-0034-0004	Borough of Seaside Park, Mayor John A Peterson, Jr.	Elected Official
BOEM-2022-0034-0005	Save Long Beach Island, Inc.	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0006	United States Environmental Protection Agency (EPA)	Federal Agency
BOEM-2022-0034-0008	Kimberly Dreher	Individual
BOEM-2022-0034-0009	Borough of Beach Haven	Local and Regional Agencies
BOEM-2022-0034-0010	The American Waterways Operators	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0011	Twin Lights Historical Society	Individual
BOEM-2022-0034-0012	ECOncrete	Other

Submission ID	Commenter	Commenter Type
BOEM-2022-0034-0013	New England and Mid-Atlantic Fishery Management Councils	Local and Regional Agencies
BOEM-2022-0034-0014	American Saltwater Guides Association	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0015	Seafreeze Shoreside, Seafreeze Ltd.	Other
BOEM-2022-0034-0016	Robert Griffin	Individual
BOEM-2022-0034-0017	Citizens Campaign for the Environment	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0018	New York Offshore Wind Alliance, Fred Zalcman	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0019	OW Ocean Winds East, LLC	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0020	World Shipping Council	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0021	New Jersey Offshore Wind Coalition	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0022	Attentive Energy LLC	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0023	Rhode Island Coastal Resources Management Council	State Agency
BOEM-2022-0034-0024	The Nature Conservancy	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0025	Massachusetts Office of Coastal Zone Management	State Agency
BOEM-2022-0034-0026	Aspen Institute, Esther Sosa, Swathi Manchikanti, Stephen Mushegan	Academic
BOEM-2022-0034-0027	Cape May County, NJ; Point O'Woods Association, Fire Island, NY	Local and Regional Agencies
BOEM-2022-0034-0028	Clean Ocean Action	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0029	American Clean Power Association	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0030	Invenergy Wind Offshore LLC	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0031	New York State	State Agency
BOEM-2022-0034-0032	National Wildlife Federation et al.	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0033	Community Offshore Wind	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0034	Vineyard Offshore LLC	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0035	Responsible Offshore Development Alliance	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0036	Atlantic Shores Offshore Wind, LLC	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0037	New Jersey Department of Environmental Protection (NJDEP)	State Agency

Submission ID	Commenter	Commenter Type
BOEM-2022-0034-0038	Long Island Commercial Fishing Association	Energy/Non-Energy Industry or Other Associations
BOEM-2022-0034-0039	Ted Barten	Individual
BOEM-2022-0034-0040	United States Coast Guard	Federal Agency
BOEM-2022-0034-0041	National Marine Fisheries Services	Federal Agency
BOEM-2022-0034-0042	Fisheries Survival Fund	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0043	Bluegreen Alliance	Environmental Advocacy and Other Public Interest Groups (NGOs)
BOEM-2022-0034-0044	National Park Service	Federal Agency
BOEM-2022-0034-0045	Wallace & Associates, Anonymous	Energy/Non-Energy Industry or Other Associations

NGO = non-governmental organization

O.1.1 General Comments

General comments are discussed in this section.

O.1.1.1 General Support

One commenter expressed general support for the NY Bight offshore wind project and said that the currently available wind turbine generators (12–14+ megawatts [MW]) coupled with decades of European construction and operating experience allows for competitive pricing and strong capacity factors. The commenter added that successful pilot programs in United States waters (Block Island, Dominion) provide additional supportive data and experience.[1]

O.1.1.2 General Opposition

The commenter expressed opposition to the current location and size of the NY Bight project.[2]

O.1.1.3 Other General Topics

One commenter recommended using the United States Environmental Protection Agency's (EPA's) NEPAssist web-based application tool for the project as well as for future projects to facilitate the environmental review process and aid in project planning. The commenter said that NEPAssist is a useful tool for identifying environmental resources in the area and could indicate potential environmental issues at the earliest stage of project development.[3]

[1] T. Barten.
[2] K. Dreher.
[3] EPA.

O.2 Purpose and Need

Comments associated with the Proposed Action's purpose and need are discussed in this section.

O.2.1 Purpose and Need for Action

Approximately 10 commenters provided feedback on the purpose and need for the Proposed Action.

Several commenters listed the threat climate change poses to the natural environment, including fisheries, as a reason for developing offshore wind in the NY Bight area. The commenters further stated that offshore wind would help achieve the Biden Administration's clean energy goals, for example deploying 30 gigawatts (GW) of offshore wind by 2030.[4]

One commenter expressed support for the purpose of the Proposed Action in the PEIS "to identify, analyze, and adopt, as appropriate, issues, degree of potential impacts, and avoidance, minimization, mitigation, and monitoring (AMMM) measures" but expressed concern that the need is framed within the context of reaching various States' goals for offshore wind generation.[5] A commenter said that deferring to Executive Orders as the "purpose and need" for offshore wind development in the Bight, rather than identifying the scientific need for these projects and how they would fulfil it, demonstrates that BOEM's course of action is already foreclosed. The commenter stated that following a course in such a predetermined way violates the National Environmental Policy Act (NEPA). The commenter stated that rather than relying on Executive Order goals to justify the development in question, the PEIS should include a thorough greenhouse gas emissions analysis for the entire life cycle of these projects, especially with respect to how long it would take for the projects to offset the amount of greenhouse gas emissions that would be required to construct, operate, maintain, and decommission them.[6]

One commenter wrote that the PEIS should clearly explain the rationale for a tiered environmental review process for NY Bight offshore wind development and that both the purpose and need along with the scope of the analysis must be clearly stated for a meaningful review process.[7] Another commenter said that the purpose and need of offshore wind is to provide needed power and to reduce greenhouse gas emissions but that this has already been done or is in the process of happening in the United States. The commenter stated that this fact needs recognition in the PEIS.[8]

O.2.2 Regulatory Jurisdiction/Statutory Authority

Three commenters provided feedback on BOEM's regulatory jurisdiction or statutory authority.

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[4] Atlantic Shores Offshore Wind, LLC; New Jersey Offshore Wind Coalition; Citizens Campaign for the Environment; R. Griffin; Attentive Energy LLC; Community Offshore Wind.
[5] Responsible Offshore Development Alliance.
[6] Clean Ocean Action.
[7] EPA.
[8] J. Binder.

One commenter disagreed with BOEM making the fulfillment of State renewable energy goals the primary goal of NY Bight development. The commenter said that BOEM's current approach is backwards, stating that it subordinates a federal, statutorily authorized process to State legislation. The commenter stated that the Purpose and Need for the Proposed Action should thus be revised.[9] Contrarily, a commenter said that, in the New York State Public Service Law Article VII review, the New York State Department of Public Service (NYSDPS) would be reviewing the proposed facility design for conformity with criteria adopted by the NYSDPS for electromagnetic field (EMF) levels "at right-of-way (ROW) edge."[10] Another commenter generally stated that BOEM has authority to regulate permitting in the outer continental shelf.[11]

O.2.3 Scope of the PEIS

Approximately 10 commenters listed additional factors that should be included in the scope of the PEIS, including:

- State commitments (project labor agreements [PLAs], prevailing wage standards, monitoring of wildlife, etc.), as they are formative to project development.[12]
- Creation of quality, family-sustaining, union jobs throughout the lifetime of the project.[13]
- Expansion of domestic manufacturing along a robust domestic supply chain.[14]
- Delivery of community benefits with attention to stakeholder engagement.[15]
- Protection of wildlife and marine ecosystems by avoiding, minimizing, mitigating, and monitoring impacts over the course of site assessment and project development, including through the utilization of the best available science and data.[16]
- Inclusion of an impact analysis that is comprehensive, transparent, objective, and quantitative, that accounts for uncertainty and addresses data gaps, considers reasonable alternatives and mitigation, assesses cumulative impacts, and requires monitoring and adaptive management.[17]
- Expansion of the PEIS to include the New Jersey Wind Energy Area (WEA), defined by lease areas Outer Continental Shelf (OCS) A–0498, 0532, A–0499, and A-0549.[18] With this expansion of the PEIS, the commenter said that additional mitigation measures should be discussed, including the

[9] Seafreeze Shoreside, Seafreeze Ltd.
[10] New York State.
[11] Aspen Institute.
[12] Bluegreen Alliance.
[13] Bluegreen Alliance.
[14] Bluegreen Alliance.
[15] Bluegreen Alliance.
[16] Bluegreen Alliance.
[17] National Wildlife Federation et al.
[18] Borough of Beach Haven; Save Long Beach Island, Inc.; Fisheries Survival Fund.

consideration of the project's visible impact on historic properties on Long Beach Island, New Jersey; consideration of the project's impact on the State's coastal zone and its conflicts with the visual resource protection elements of the State's coastal zone management rule; and consideration of the impact of operational turbine noise on fin and humpback whales that frequent the inner part of the project area.[19]

- Expansion of the PEIS to include alternative WEAs.[20]
- Inclusion of substantive programmatic AMMM measures to address issues including the cumulative impacts of construction and operational noise on the migration of the North Atlantic right whale, the cumulative impact of multiple vessel surveys, and the cumulative impact on migratory birds.[21]
- Inclusion of the following items when evaluating impacts on the human environment and on a range of onshore components:[22]
    - The New York State Department of Transportation (NYSDOT) Utility Accommodation Plan.
    - The location of State highway ROW boundaries and road classifications for onshore planning of transmission line siting.
    - Coordination between local, State, and federal partners when transportation planning.
    - Consideration of the siting pathway options for the transmission line location when determining the location of points of interconnection.
    - Acknowledgement of the role of NYSDOT in evaluating transportation as a component of the human environment and involve the New York State transportation real property and engineering experts in all proposals for onshore transmission siting impacting State roads and highways.
    - Adherence to the NYSDOT Standard Specifications when installing utilities within a State highway ROW.
    - Recognition that any proposal to locate a transmission facility within a State highway ROW should minimize impacts on highway use, safety, maintenance, aesthetics, and future highway improvements.
- Consideration of impacts to National Oceanic and Atmospheric Administration (NOAA) trust resources from the full build-out of the six lease areas and a holistic, ecosystem approach to considering AMMM measures to reduce those impacts. This includes fully evaluating interactions among all impact-producing factors and associated responses by marine trust resources,

[19] Save Long Beach Island, Inc.
[20] Save Long Beach Island, Inc.
[21] Save Long Beach Island, Inc.
[22] New York State.

oceanographic and atmospheric processes, and fishing activities across all lease areas within the NY Bight. Specifically, the commenter recommended that the PEIS consider impacts on ocean circulation, citing Department of the Interior guidance. The commenter also added that the PEIS should consider impacts on affected resources and fishery operations at an initial stage and that such consideration will necessitate the development of alternatives to a full build-out of the six lease areas.[23]

- Distinguishing carefully and realistically at the PEIS level between impacts that are “moderate to major” (for which project-specific analysis is required), and those that are “negligible to minor” (for which a programmatic analysis may suffice).[24] Addressing the appropriateness and relative importance of the selected scale against which impacts are being assessed, in terms of both temporal and spatial stressors and receptors.[25]
- Consideration of the lease areas being located in one of the prime hurricane zones in the United States[26]

O.2.4 Other Comments on the Purpose and Need for the Proposed Action

Six commenters provided other comments on the purpose and need for the Proposed Action.

One commenter generally expressed support for the goals and intent of the PEIS process.[27] Another commenter encouraged BOEM to prepare supporting documentation and studies that could quantify the monetary value of cleaner energy sources, good-paying jobs, and historic investments in American energy-supply chains, as well as account for losses that result without full utilization of the lease area in question. The commenter recommended that BOEM incorporate this information into the Purpose and Need of the PEIS.[28]

A commenter expressed concern that BOEM has no intent to disapprove a project or part of a project if its Purpose and Need is to fulfill a developer’s power purchase agreement with a utility or to fulfill the nameplate capacity of a project as submitted in the Construction and Operations Plan (COP). The commenter further stated that BOEM must rescind its recent NEPA standardization and conform its process, including the NY Bight PEIS process, to a full consideration of alternatives, including those that might not meet a developer’s proposed nameplate capacity or speculative power purchase agreement.[29] Another commenter said that the PEIS should provide a detailed discussion on the goals of the six NY Bight lessees and the renewable energy goals of New York and New Jersey that the six lease areas are designed to serve. The commenter remarked that the applicants’ goals form the basis (along with other

[23] National Marine Fisheries Services.
[24] Fisheries Survival Fund.
[25] The Nature Conservancy.
[26] Borough of Seaside Park.
[27] OW Ocean Winds East, LLC.
[28] Atlantic Shores Offshore Wind, LLC.
[29] Seafreeze Shoreside, Seafreeze Ltd.

factors) for BOEM's Purpose and Need for the Proposed Action and are used as screening criteria for alternatives to be analyzed in detail in a project-specific Environmental Impact Statement (EIS).[30]

One commenter said that BOEM must evaluate the tradeoffs associated with various levels of power generation against the economic and cultural importance of regional fisheries in this PEIS. Pursuing too narrow an analytical approach in this PEIS, the commenter wrote, would predetermine all project parameters and limit the range of possible mitigation measures when a project-specific EIS is conducted, thus resulting in many otherwise appropriate mitigation measures being excluded from consideration at any point in the process.[31] Regarding BOEM's *Process for Identifying Alternatives for Environmental Reviews of Offshore Wind COPs pursuant to the National Environmental Policy Act NEPA*, published in June of 2022, a commenter expressed concern that BOEM changed the wording of a document that would be the basis for the purpose and need for an EIS for any COP.[32]

O.3 Proposed Action and Alternatives

Comments associated with the overall Proposed Action and its alternatives are discussed in this section below.

O.3.1 Proposed Action's Adoption of AMMM Measures for the NY Bight Lease Areas

Approximately 20 commenters listed AMMM measures that they said should be adopted or considered for the NY Bight lease areas, such as:

- Those that incorporate ecological design elements, such as the use of recycled or "environmental concrete," into offshore wind infrastructure as they significantly increase species settlement, richness, and abundance.[33]
- Those that minimize impacts on benthic habitats, pelagic habitats, and fisheries. The commenter stated that benthic habitat impact minimization should remove high value habitat areas, identified by surveys and mapping areas from consideration of development; that pelagic habitat impact minimization analyze an alternative that would consider the impact of the full build-out development along with other proposed offshore wind development in the region on pelagic habitats in the NY Bight, including the Mid-Atlantic Cold Pool; and that fisheries impact minimization should consider consistent wind turbine generator spacing across lease areas to increase the likelihood that fishing can still occur. Also listed were those that coordinate and consolidate routes for export cables, that ensure all export cable routes for interconnections with the grid avoid crossing through estuaries and embayments, that consider all feasible avoidance and minimization measures in the project design and incorporate all available AMMM measures as mandatory

[30] Invenergy Wind Offshore LLC.
[31] Responsible Offshore Development Alliance.
[32] Long Island Commercial Fishing Association.
[33] ECOncrete.

conditions of COP approval, or that incorporate no avoidance and minimization alternatives or AMMM measures.[34]

- Those that primarily avoid negative impacts on valuable fisheries, as opposed to a reliance on mitigation techniques to be employed after lease development.[35]

- Those that first address different options for full build-out and that incorporate up-front avoidance and minimization approaches (e.g., high value habitat that should be avoided). The commenter recommended that these alternatives consider a range of AMMM measures that provide minimal to maximum feasible protection. Further, thorough evaluations of available data on existing resources could help facilitate optimal project design that avoids and minimizes impacts on trust resources throughout the NY Bight while also achieving energy generation goals. The commenter also recommended that the PEIS' Proposed Action be described as the "*full build out* of all six lease areas while incorporating AMMMs" and that mitigation measures be evaluated for their efficacy under each alternative considered by the PEIS.[36]

- Those that create measurable criteria for excluding areas from development when the risk to the physical and human environment exceeds acceptable thresholds, and apply those on regional and project-specific bases in the NY Bight and all regions.[37]

- Those that are technically and commercially feasible, and thus reasonable under NEPA, cautioning that combined AMMM measures should be examined for whether they would cumulatively threaten the viability of projects.[38]

- Those that assess the impacts of project design ranges for each lease area. Further, BOEM should apply this approach for all impact assessments to ensure that the PEIS assessments and AMMM measures capture the reality of the wide range of scenarios.[39]

- Those that include the mitigation considerations identified in BOEM's draft Fisheries Mitigation Guidelines in the PEIS, especially those mitigation guidelines set forth in subparts B (Project Siting, Design, Navigation, and Access) and D (Environmental Monitoring) of the Fisheries Mitigation Guidelines.[40]

- Those that consider larger turbine sizes to reduce windfarm footprints, that complement offshore wind structures with nature inclusive designs to further enhance the artificial reef effect, that

[34] National Marine Fisheries Services.
[35] Fisheries Survival Fund.
[36] National Marine Fisheries Services.
[37] Responsible Offshore Development Alliance.
[38] Vineyard Offshore LLC.
[39] OW Ocean Winds East, LLC.
[40] Fisheries Survival Fund.

ensure the ability of recreational anglers to fish within turbine arrays, and that standardize environmental monitoring across projects.[41]

- Those that incorporate the needs and decision-making of cooperating agencies, that evaluate the effect and effectiveness of programmatic AMMM measures, and that reflect the best available scientific and technological information.[42]
- Those that require an adaptive management plan, whereby if environmental impacts are substantially different than anticipated, operational modifications could be evaluated and executed.[43]

One commenter said that BOEM should refrain from adopting any AMMM measures through this programmatic approach that would jeopardize the Country's ability to address the climate crisis. The commenter suggested that BOEM adhere to its new NEPA alternatives screening criteria in developing the AMMM measures, and recommended that each AMMM measure be technically and economically practical and not undermine any project's future specific purpose and need statements. In particular, the commenter cited a BOEM provision on the prevention of waste and stated that alternatives and AMMM measures should be evaluated based on whether and to what extent they would have foreseeable impacts on the energy generation potential of an offshore wind lease. Furthermore, the commenter stated that BOEM's alternative analysis should exclude project design alternatives and instead focus on the implementation of AMMM measures.[44] A commenter remarked that in order to determine if the subsequent site-specific COPs would have greater, equal, or fewer impacts than those analyzed in the PEIS, it is important that the programmatic AMMM measures provide a metric that allows for a comparison of a project that employs the best practice AMMM measures (lowest impact) and the No Action Alternative (highest impact).[45] Another commenter recommended redefining the Proposed Action to include the development of the lease areas with no AMMM measures and include the implementation of different AMMM measures in other alternatives.[46]

Regarding AMMM measures, one commenter stated that BOEM should focus primarily on moderate or major impacts in individual COPs instead of duplicating analyses in areas that have been determined to cause only minor impacts or no impacts in the EIS.[47] A commenter said that each AMMM measure should be analyzed separately, as individually defined alternatives or sub-alternatives, as well as cumulatively. The commenter wrote that this would allow the public to better understand the impact each measure has on mitigation, particularly if individual projects propose using only a subset of the measures in a COP. Further, the commenter remarked that development of the AMMM measures from the PEIS should serve as a baseline for the minimal level of mitigation expected by a lessee for any

[41] American Saltwater Guides Association.
[42] Invenergy Wind Offshore LLC.
[43] New York State.
[44] American Clean Power Association.
[45] National Wildlife Federation et al.
[46] EPA.
[47] Citizens Campaign for the Environment.

project. Merely adopting the programmatic measures is not expected to be sufficient to remedy the impacts from offshore wind development and should not be viewed as a cap for any mitigation measure, regardless of the scale of the impact: negligible, minor, moderate, or major. The commenter added that a future PEIS should be provided prior to lease auctioning because of the importance of siting to environmental impacts and that future, project-specific alternative analyses should be conducted in EISs rather than environmental assessments. The commenter also expressed disappointment that the PEIS did not include Empire Wind, Atlantic Shores, and Ocean Wind projects; the commenter stated that these projects are in the immediate region and that they should include programmatic AMMM measures similar to any adopted for the NY Bight because of common cumulative impacts.[48]

One commenter stated that BOEM's AMMM analysis should be sufficiently flexible as to avoid foreclosing the use of AMMM measures that may evolve after the PEIS analysis is complete but prior to project implementation, and that would also achieve the same or lesser level and type of impacts. The commenter requested that BOEM ensure that, through consultation with the lessees, the AMMM measures evaluated will be both technically and economically feasible.[49]

A commenter remarked that BOEM should provide clarity in the PEIS on how it would determine whether a particular programmatic AMMM measure applies to a given NY Bight project. The commenter also recommended that BOEM identify required mitigation outcomes and representative examples of approaches that could serve to mitigate project impacts, without mandating specific technologies as programmatic AMMM measures.[50] One commenter expressed concern that BOEM would adopt the current Draft Fisheries Mitigation Guidance document as an AMMM measure in the upcoming NY Bight PEIS as a way to downgrade major fisheries impacts. The commenter stated that this guidance document is procedurally and substantively deficient and referred to its comment on the Draft Fisheries Mitigation Guidance document for further detail.[51] A commenter recommended that BOEM use this PEIS to adopt AMMM measures based on the forthcoming final Guidance for Mitigating Impacts of Offshore Wind Energy Projects on Commercial and Recreational Fisheries.[52] Another commenter expressed concern that the Draft Guidance emphasizes compensation too heavily and that AMMM measures for the NY Bight should be analyzed individually in order to prioritize avoidance of impacts.[53]

O.3.2 Comments on Reasonable Alternatives

Seven commenters recommended alternatives for BOEM or developers to consider or implement in offshore wind development in the NY Bight area, including:

- Alternatives for Manufacturing, Staging, and Assembly

48 Responsible Offshore Development Alliance.
49 Community Offshore Wind.
50 Attentive Energy LLC.
51 Seafreeze Shoreside, Seafreeze Ltd.
52 New England and Mid-Atlantic Fishery Management Councils.
53 Responsible Offshore Development Alliance.

  - Evaluate available alternatives for staging and assembly of offshore wind components including utilizing jack-up barges and platforms in the NY Bight.[54]

- Alternatives for Appurtenant Structures
  - Identify scenarios for co-locating with offshore infrastructure such as existing and future transmission infrastructure, telecommunications, and battery storage projects.[55]

- Alternative Submarine Cable Configurations
  - Evaluate co-locating submarine cables to minimize impacts on sensitive environmental resources, including but not limited to, complex benthic habitats, saltmarshes, and submerged aquatic vegetation (SAV).[56]

- Alternative Turbine Layouts
  - Evaluate a range of turbine layout scenarios to ensure sufficient energy generation and promote co-existence with fishing industries.[57]

- Alternative Habitat Impact Minimization Measures
  - Include a conceptual habitat impact minimization alternative to avoid highly sensitive and significant habitat types and possibly avoidance areas.[58]

- Alternative Construction Methodologies
  - Evaluate alternative offshore installation methodologies that allow simultaneous trenching and cable lay to minimize impacts on water quality and benthic habitat.[59]

- Locating the project in the Hudson South Call Area, which is 30 to 57 miles offshore, where turbines would not be visible.[60]

- Land based alternatives, which the commenter characterized as the most rapid and efficient efforts to achieve energy efficiency, resource conservation, and global warming mitigation, and to prevent the Jersey Shore ocean from becoming a “dumping ground.”[61]

One commenter said that an alternatives analysis must consider a pilot project. The commenter stated that a small, local pilot project that uses the proposed technology and could be robustly evaluated

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[54] New York State.
[55] New York State.
[56] New York State.
[57] New York State.
[58] New York State.
[59] New York State.
[60] K. Dreher.
[61] Borough of Seaside Park.

before, during, and after construction is the only way to address shortcomings in the project (e.g., a need for quantitative and qualitative scientific observation, logistical planning, clearance of military hazards) and begin the path toward responsible development of offshore wind energy in the NY Bight waters through a process that reflects fair, responsible, and good governance. The commenter stated that research on the impacts of wind development in regions other than the NY Bight should not be relied upon because of the unique characteristics of the NY Bight. The commenter provided descriptions of conditions in other wind development regions that differ from those of the NY Bight, stating that postponing development in the NY Bight would allow more time to recover unexploded munitions and mustard gas.[62] Similarly, another commenter said that a limited test project alternative must be considered. A test project would facilitate gathering information on benefits and impacts before a large project is implemented.[63]

A commenter requested that BOEM apply the screening criteria for the alternatives described in its 2022 "Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operation Plans pursuant to the National Environmental Policy Act (NEPA)" guidance in determining the reasonable range of alternatives for the PEIS. The commenter stated that by defining a reasonable approach to the alternatives analysis, the PEIS could appropriately reflect BOEM's extensive process of analyzing and leasing the WEA, preserve the goals of the applicants who have secured leases based on investment-backed expectation of wind energy output, and identify proposed and alternative AMMM measures that adequately address environmental impacts.[64]

One commenter said that the PEIS should acknowledge and consider the considerable pre-auction reduction in the NY Bight WEAs, given that prior reduction of any alternatives that further significantly reduce site utilization would both be unnecessary and run counter to federal and State clean energy goals. The commenter stated that PEIS alternatives should maximize site utilization in order to preserve project viability and added that BOEM should seek buy-in from other agencies to minimize environmental review work to be conducted after the PEIS stage.[65]

O.3.3 Comments on No Action Alternative

Five commenters provided feedback on the No Action Alternative.

One commenter recommended that BOEM implement the No Action Alternative until all relevant and essential scientific information has been accumulated, thoroughly reviewed, and disseminated to the public.[66]

A commenter said that BOEM's No Action Alternative should acknowledge the unsettling effects of a project denial on cumulative economic benefits due to disruption in supply chain investments.[67] Another

[62] Clean Ocean Action.
[63] J. Binder.
[64] Invenergy Wind Offshore LLC.
[65] OW Ocean Winds East, LLC.
[66] Borough of Seaside Park.
[67] American Clean Power Association.

commenter stated that a robust analysis of the benefits of clean energy should be included in all alternatives and be compared to the impacts (air quality, water quality, etc.) that would flow from fossil fuel use inherent in the No Action Alternative.[68]

One commenter remarked that the No Action Alternative is supposed to serve as a comparative tool for the Proposed Action, but currently allows for little understanding of efficacy of the AMMM measures of the Proposed Action. The commenter recommended redefining the Proposed Action to include the development of the lease areas with no AMMM measures and include the implementation of different AMMM measures in other alternatives.[69] Another commenter said that the PEIS must provide a comprehensive, transparent, and fair analysis of the potential risks and impacts associated with offshore wind energy development activities in the New York and New Jersey Bight, and thus, from the outset, should include an alternatives analysis that contains both a pilot project and a true No Action Alternative.[70]

O.4 Resource and Stressor Topics

Comments associated with individual resources and impacts are discussed this section.

O.4.1 Air Quality

Five commenters provided feedback on air quality issues.

A couple of commenters recommended that the PEIS include National Ambient Air Quality Standards (NAAQS) to better understand the level of air pollutants impacts of wind energy development.[71] Similarly, a few commenters asked that the PEIS consider the impacts of "construction, operation & maintenance, and decommissioning" of wind energy projects on air quality and that these impacts be extensively reviewed as part of the PEIS.[72]

One commenter recommended that preparation of the PEIS include consultation with the EPA and the New York State Department of Environmental Conservation (NYSDEC) in order to include the most accurate information about air quality impacts. The same commenter asked that the environmental impact assessment include an evaluation of changes to air circulation from wind turbines and that the PEIS describe its compliance with federal and State emissions and air quality regulations. They also listed a number of air emission controls for BOEM to consider, including parts per million (ppm) restrictions on diesel generators, ppm restrictions on vessel fuels, and vessel and boiler standards.[73]

Another commenter recommended that the PEIS consider sources of pollution that would impact air quality or violate federal or State ambient air quality standards. The same commenter asked that the

[68] OW Ocean Winds East, LLC.
[69] EPA.
[70] Clean Ocean Action.
[71] New York State; EPA.
[72] Borough of Seaside Park; New York State; EPA.
[73] New York State.

PEIS include options that "explore diesel controls, cleaner fuel and construction practices" or other technology that reduces emissions from wind energy development.[74]

One commenter asserted that BOEM should focus its analysis of the climate benefits of offshore wind development and stated that the benefits from substituting clean energy for fossil fuel generation apply to BOEM's air quality analyses.[75]

O.4.2 Areas of Special Concern

Five commenters provided feedback on areas of special concern.

A couple of commenters discussed a proposal to designate the Hudson Canyon a National Marine Sanctuary. Specifically, one commenter asserted that BOEM should prepare for the impacts of such a designation, especially with possible changes to vessel traffic and fishing activity in the surrounding areas, and account for such changes in the PEIS.[76] Another commenter mentioned the ongoing process of designation and urged BOEM to work with the NOAA, New York and New Jersey, and Tribal Nations to "identify boundaries that avoid overlap with existing wind leases."[77]

One commenter asked that BOEM enforce restrictions on construction and operations of wind energy development on certain areas where migration, spawning events, and other marine processes take place at certain times of the year. The same commenter also asked that BOEM "implement the precautionary principle" for areas of sensitive habitat, spawning areas, and access management areas for fisheries.[78]

One commenter asserted that the PEIS should account for and investigate the impacts on waterways and coastal habitats caused by all stages of wind energy development and went on to cite a number of areas of particular importance, including estuaries in New York and New Jersey and a few Research Reserves.[79]

One commenter discussed both the Holgate Wildlife Refuge and the Forsythe National Wildlife Refuge as areas of particular importance to bird species and criticized the lack of studies on the impact of the proposed project on such refuges.[80]

O.4.3 Avoidance, Minimization, Mitigation, and Monitoring (AMMM) Measures (Including Stipulations)

Approximately 10 commenters offered both general and issue-specific comments on AMMM measures.

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[74] EPA.
[75] American Clean Power Association.
[76] Fisheries Survival Fund.
[77] New Jersey Offshore Wind Coalition.
[78] Responsible Offshore Development Alliance.
[79] Clean Ocean Action.
[80] K. Dreher.

O.4.3.1 General

A couple of commenters urged BOEM to adopt an "adaptive management" framework or process for AMMM measures in order to ensure that these measures can account for technology and information changes.[81] One of the commenters asserted that BOEM should use a "step-wise" approach that considers avoidance of impacts before mitigation and, at last resort, compensation. In the event that compensation is necessary, the commenter recommended that compensation be implemented on a regional scale in order to allow for in-kind and onsite measures to be considered for difficult-to-replace resources. The commenter cited its own guidance as further indicating that offsetting mitigation provisions should be generous to allow for uncertainty in the mitigation's efficacy.[82]

A few commenters debated whether AMMM measures might be more effective on a regional instead of a project-specific level: one commenter stated that BOEM could evaluate at which scale AMMM measures would be more effective,[83] another asserted that compensatory mitigation should be implemented on a regional scale,[84] and another asserted that conducting evaluations of the effectiveness of different AMMM measures could be done on a "project-specific basis."[85]

One commenter encouraged BOEM to support environmental monitoring plans in coordination with federal, State, and industry partners and require data from those plans to be made publicly available.[86] Another commenter asserted that offshore wind should be developed in a manner that is environmentally responsible, mitigates impacts on wildlife, engages involved stakeholders, and continuously monitors impacts on habitats and ocean wildlife.[87] Yet another commenter asserted that AMMM measures will in turn inform COP risk mitigation for addressing important environmental and economic issues during offshore wind development.[88]

A commenter discussed BOEM's intent to focus on impacts from "representative projects" rather than speculation of potential impacts, asserting that this process is a better way to identify AMMM measures.[89]

A commenter listed a number of guidelines for what they believe AMMM measures should look like, such as:

- AMMM measures should be "methodologies, not mandates."
- AMMM measures should be grounded in best available science and best practices informed by developer collaboration and through State and regional initiatives.

[81] National Marine Fisheries Services; The Nature Conservancy.
[82] National Marine Fisheries Services.
[83] New York State.
[84] National Marine Fisheries Services.
[85] Community Offshore Wind.
[86] Responsible Offshore Development Alliance.
[87] Bluegreen Alliance.
[88] Aspen Institute.
[89] The Nature Conservancy.

- AMMM measures should attempt to support appropriate alternatives and address identified risks, effects, and impacts.
- AMMM measures should attempt to balance efficacy, intent, and safety.

The commenter encouraged BOEM to coordinate with different agencies to design AMMM measures.[90]

One commenter urged BOEM to use the PEIS to "assess the efficacy of AMMMs" and identify other appropriate AMMM measures.[91]

One commenter recommended that BOEM use the PEIS scoping process to inform their mitigation approach, and stated that monitoring and mitigation activities may occur outside of the lease area, especially for species that are highly mobile.[92] Another commenter urged BOEM to require further monitoring for areas in which data is sparse.[93]

O.4.3.2 Issue-Specific

A few commenters discussed AMMM measures specific to construction and operational impacts:

- A commenter encouraged the development of standards regarding foundation design and cable installation to ensure that impacts on protected species are minimized. They also asked that standards for night and low-visibility construction and protocols for coordination between project activities designed to avoid the generation of sound fields and other construction and operational impacts be required, schedules for construction and drilling be adapted to avoid impacts on migratory and time of year dependent species, and that "third-party protected species observers" be required to help implement mitigation and monitoring measures.[94]
- The same commenter also encouraged several monitoring measures related to construction and operation of wind energy development, including monitoring impacts of noise levels during construction, operation, and maintenance; impacts of the physical presence of turbines; and displacement of and changes to fishing activity around the lease areas, among others. They also urged consideration of multiple project designs that can better minimize impacts on important resources, such as changes to foundations and cable burying procedures, and recommended that BOEM develop standards for determining when foundation designs that do not rely on pile-driving would be appropriate. Additionally, the commenter recommended that BOEM require routine clean ups of ghost gear and other debris around foundations[95]
- A commenter referenced the "Fisheries Mitigation Guidelines" as a resource to consider for the impacts of wind energy development on the commercial fishing industry. They asserted that AMMM

[90] Atlantic Shores Offshore Wind, LLC.
[91] National Marine Fisheries Services.
[92] The Nature Conservancy.
[93] New Jersey Offshore Wind Coalition.
[94] National Marine Fisheries Services.
[95] National Marine Fisheries Services.

measures should implement standards that integrate closely with these guidelines, such as incorporating design elements that maximize fishery access, reducing space-use conflicts through infrastructure planning, coordination of cable routes and turbine layouts, and other consistent and standardized measures.[96]

- One commenter expressed concern about project development–based cumulative impacts on different species, such as light, noise, and EMF disruptions and recommended that BOEM and other agencies develop monitoring plans in addition to AMMM measures in order to better track such disruptions.[97]

- Another commenter urged close consideration of site design and layout in order to avoid and mitigate impacts on fishing, benthic resources, and more. They also encouraged time of year/day restrictions on construction in order to protect certain species and asked that Horizontal Directional Drilling (HDD) installation methods be reviewed.[98]

- Another commenter urged BOEM to consider changes to offshore wind layout and design as a way of mitigating overlaps with the fishing community. They also listed a number of key measures for fisheries mitigation for BOEM's consideration, such as monitoring fisheries impacts for the life of projects; assessing cumulative impacts of offshore wind on whales and other protected resources through all project phases; conducting species-specific studies for fish stocks that may experience unique impacts; and analyzing impacts of impingement and entrainment, increased water temperature, and larval and juvenile fish mortality.[99]

- A commenter suggested that BOEM include accidental releases and spill mitigation measures and a Spill Prevention, Containment and Countermeasure Plan in the PEIS and urged BOEM to consider spills and accidental releases as long-term issue.[100]

A couple of commenters offered AMMM measures specific to the presence of turbines and cables, including vessel strike risks, entanglement concerns, and more:

- One commenter expressed concern about the increased risk of vessel strike from offshore wind development and asserted that reducing all vessel speeds to 10 knots or less could be an effective and even vital mitigation technique for BOEM to consider.[101]

- The same commenter also discussed turbine collision risks for birds and bats and listed some AMMM measures for preventing and mitigating those risks, such as installing collision detection

[96] Fisheries Survival Fund.
[97] National Park Service.
[98] New York State.
[99] Responsible Offshore Development Alliance.
[100] EPA.
[101] National Wildlife Federation et al.

capabilities in turbines, setting turbine height limits, and committing to monitoring collisions to inform how best to avoid them in the future.

- They recommended that BOEM adopt a number of measures to monitor for and mitigate entanglement with turbines and their foundations, including constant monitoring of strain on mooring lines and cables and visual inspection of turbine platforms and cables.

- They also offered some AMMM measures for avoiding the negative impacts of offshore wind cables, including using "jet plow" technology for installation, requiring cable burial during some seasons, avoiding open loop cooling systems due to their negative impact on marine life, and working with fishery managers to better understand adverse impacts on marine life from turbine cables.[102]

- A commenter asserted that BOEM should "avoid routing export cables through estuaries and embayments" due to their being a home for many sensitive habitats and resources. They also listed a number of minimization and mitigation techniques as they apply to cables, including using cable export corridors that avoid important resources, identifying areas that would allow for full cable burial without scour protection, and considering many different project designs that might best minimize the negative impacts of cables.[103]

A couple of commenters discussed AMMM measures for protecting certain species and their habitats:

- A commenter asserted that standards for protected species monitoring should be adopted. They also stated that protocols for addressing unexploded ordnances should be implemented with a focus on avoiding or mitigating exposure to protected species and habitats.[104]

- The same commenter asserted that "compensatory mitigation" should be a requirement for any unavoidable impacts on protected species and their habitats, and that lessees should contribute to this strategy. They also discussed a number of measures for monitoring impacts on important species and habitats, including assessing changes to the seafloor; continuous Passive Acoustic Monitoring (PAM) of marine mammals, turtles, and fish; regular oceanographic sampling; and monitoring efforts through the Regional Wildlife Science Collaborative for Offshore Wind (RWSC).[105]

- One commenter asked that BOEM conduct studies specific to species that might experience unique impacts, especially those deemed protected species like whales.[106]

O.4.4 Bats

Two commenters provided comments on issues in the NY Bight PEIS related to bats.

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[102] National Wildlife Federation et al.
[103] National Marine Fisheries Services.
[104] National Marine Fisheries Services.
[105] National Marine Fisheries Services.
[106] Responsible Offshore Development Alliance.

One commenter expressed concerns about behavioral and physiological impacts on bats from offshore wind turbines and asked that the PEIS identify distribution and migration routes, and sonar and echolocation practices. The commenter also recommended that the PEIS examine the Block Island Wind Farm acoustic surveys to better understand the impact of offshore wind construction on bats.[107]

One commenter listed several species of bats found at areas relevant to the NY Bight PEIS, including Gateway and Fire Island National Seashore.[108]

O.4.5 Benthic Resources

Five commenters provided feedback on issues in the NY Bight PEIS related to benthic resources.

A few commenters generally discussed impacts on benthic resources from offshore wind construction and development, including degradation of the seabed, disruptions to the benthic ecosystem, adverse effects on sediment biogeochemistry, and general energy emission impacts, such as those from noise, vibration, and EMFs.[109] One commenter expressed concern about offshore wind development changing how fish species utilize soft-bottomed and nearshore benthic habitat.[110]

One commenter asserted that the PEIS must include a thorough analysis of the impacts of offshore wind development on benthic resources in the area, in part because information about short- and long-term impacts is currently lacking.[111] Another commenter discussed benthic environments around Gateway and Fire Island National Seashore and criticized the fact that the "issue of potential landfall locations for power cables" is not currently addressed in the NOI, and urged BOEM to address it in the PEIS.[112]

A commenter encouraged BOEM to identify benthic resources like important areas for deep water corals as well as existing benthic and shellfish resources. They asked that the PEIS evaluate impacts from excavation and sediment dispersal, as well as disturbance that might be caused by construction and other maintenance activities. They also urged the PEIS to "quantify cable and scour protection disturbance areas," evaluate construction monitoring, and generally minimize impacts on benthic habitat. The commenter also recommended that BOEM include "nature-inclusive designs," such as using material alternatives to concrete mattresses.[113]

One commenter asserted that a growing body of research points toward the benthic effects of offshore wind and asked that the PEIS thoroughly consider such impacts.[114]

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[107] New York State.
[108] National Park Service.
[109] Fisheries Survival Fund; Clean Ocean Action; National Park Service; New York State.
[110] National Wildlife Federation et al.
[111] Clean Ocean Action.
[112] National Park Service.
[113] New York State.
[114] Fisheries Survival Fund.

O.4.6 Birds

Nine commenters provided feedback on issues in the NY Bight PEIS related to birds.

O.4.6.1 Comments on Species

Some commenters generally discussed the abundance of birds in and around the NY Bight area, including but not limited to species of plovers, terns, gulls, shorebirds, waterfowl, hawks, egret, sandpiper, ducks, owls, skimmers, osprey, and more, many of which are considered endangered or threatened.[115] One commenter asserted that there are over 400 different species of birds in New Jersey and 503 species in New York,[116] while another commenter stated that around 333 avian species have been found in the Fire Island National Seashore area and around 326 species have been found in the Jamaica Bay Wildlife Refuge.[117]

A few commenters specifically mentioned the presence of the threatened Piping Plover in the NY Bight area, expressing concern about the effects of wind energy development on that species' survival and wellbeing.[118] One commenter specifically asked that the piping plover receive a review under the Endangered Species Act (ESA).[119] Another commenter stated the importance of the Holgate and Forsythe Wildlife Refuges to the Piping Plover and criticized studies for not showing how the proposed project would affect these refuges.[120]

O.4.6.2 Impacts on Birds

A few commenters expressed general concern for negative impacts on birds, especially migratory species, from wind energy development in the NY Bight area. One commenter asserted that the geographic location and important water resources of the Raritan and Sandy Hook Bays make those areas an important "migratory staging area" for birds on the Atlantic Flyway. The same commenter added that habitats in the Fire Island National Seashore and Jamaica Bay are important resting and feeding areas for migratory birds, especially the Piping Plover. [121] A couple of commenters asked that cumulative impacts on bird wildlife and their habitats from wind energy development be reviewed and investigated in the PEIS.[122]

A few commenters expressed concern about mortality risks to birds from collision with turbine blades, disorientation and displacement risk from the lighting of turbines and wind energy stations, and noise disruption from turbines and their blades/general operation.[123] One commenter asserted that the PEIS

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[115] National Park Service; Clean Ocean Action; New York State; Save Long Beach Island, Inc.; National Wildlife Federation et al.
[116] Clean Ocean Action.
[117] National Park Service.
[118] National Park Service; K. Dreher; Save Long Beach Island, Inc.
[119] Save Long Beach Island, Inc.
[120] K. Dreher.
[121] National Park Service.
[122] Borough of Seaside Park; National Wildlife Federation et al.
[123] Clean Ocean Action; New York State; Save Long Beach Island, Inc.

must identify and review these numerous impacts on birds, as well as identify ways to mitigate and minimize those impacts to the greatest extent possible.[124] Another commenter asked that BOEM consider information from the Block Island Wind Farm post-construction surveys in order to better assess impacts on bird species from wind energy development.[125] One commenter asked about results from studies regarding the environmental impact on birds from proposed development.[126]

One commenter expressed concern about a number of other wind energy development risks to birds, including upticks in prey resources around the turbines, which could lead to more collisions, potential oil and lubricant spills in the ocean, and destruction of habitat in order to make way for onshore substations and port facilities.[127]

One commenter criticized BOEM's use of a 98 percent turbine avoidance rate, asserting that referenced studies supporting that number are not representative of the scale of the Proposed Action in the NY Bight area and that uses of the 98 percent avoidance rate are not supported well enough. They also urged BOEM to do a current assessment of collision and fatality risks and asserted that such a cumulative risk analysis would require the inclusion of the New Jersey wind area in the PEIS.[128]

One commenter asked that BOEM identify "seasonal distribution, aggregation, abundance and migration routes" for birds in the area, specifying sea duck abundance as an important consideration.[129] Another commenter asked that BOEM generally protect avian species in its development of offshore wind.[130]

O.4.7 Climate Change

Approximately 10 commenters provided feedback on climate change as it relates to the NY Bight PEIS.

Some commenters generally addressed the global threat of climate change and how offshore wind development might fit into the process of combating climate change. Specifically, a couple of commenters asserted that the swift development of offshore wind projects is needed to address the climate crisis/emergency.[131] One commenter asserted that offshore wind development is "a critical strategy…at the State and federal levels" to counteract reliance on fossil fuel generation,[132] while another called it "one significant part of the antidote" for fighting climate change.[133] Another

[124] Clean Ocean Action.
[125] New York State.
[126] Twin Lights Historical Society.
[127] Clean Ocean Action.
[128] Save Long Beach Island, Inc.
[129] New York State.
[130] New York Offshore Wind Alliance.
[131] Atlantic Shores Offshore Wind, LLC; Attentive Energy LLC.
[132] New York Offshore Wind Alliance.
[133] Citizens Campaign for the Environment.

commenter asserted that wind energy installations would need to be quadrupled by 2030 in order to avoid climate change's worst effects.[134]

One commenter addressed climate change impacts specific to New York, including sea level rise and flooding, damages from major storms like Superstorm Sandy, warmer winters and hotter summers, air and ocean pollution from fossil fuels, and the destruction of certain ecosystems and species, like the 90 percent decline of the lobster species from warmer waters.[135]

A few commenters approached the idea of using offshore wind development to combat climate change with more caution. One commenter professed general support for offshore wind development to combat climate change but cautioned against developing these projects without a greater understanding of their impact on Atlantic coast resources and waters elsewhere.[136] One commenter asserted that, due to expanded use of fossil fuels overseas, the Proposed Action is unlikely to have a large impact on climate change, and that this use of fossil fuels should be considered as "part of Foreseeable Impacts" for each of the environmental issues and scenarios analyzed in the Draft PEIS for the Proposed Action and No Action Alternative. The same commenter also asserted that offshore wind may not be the best way to combat climate change and criticized BOEM's "silo" approach of limiting offshore wind as the only future clean energy projects, stating instead that BOEM should consider more clean onshore development projects and include the evaluation of those projects in the PEIS.[137]

One of the commenters that supported more offshore wind projects cautioned that they have a reciprocal relationship to climate change, meaning that they help to mitigate it but are nonetheless affected by it as well. They criticized BOEM's lack of climate change–related information in its evaluation process and urged BOEM to undergo a systematic process for "a holistic understanding science-based understanding of climate change and how offshore wind energy exists within it."[138] Another commenter that professed their support for offshore wind urged BOEM to weigh the environmental benefits to combat climate change with any negative impacts of offshore wind construction.[139]

A couple of commenters asserted that assessments of the climate change benefits from offshore wind should be a key part of the PEIS.[140]

One commenter asked that BOEM assess the Proposed Action's alignment with climate change policies like the Climate Act, consider environmental impacts and habitat changes from the Proposed Action in concert with current and future climate change impacts, and ultimately "evaluate the Net Carbon

[134] R. Griffin.
[135] Citizens Campaign for the Environment.
[136] American Saltwater Guides Association.
[137] J. Binder.
[138] R. Griffin.
[139] Citizens Campaign for the Environment.
[140] OW Ocean Winds East, LLC; American Clean Power Association.

Footprint" of its Proposed Action. They also urged BOEM to evaluate climate mitigation measures that would help reduce possible climate impacts.[141]

One commenter recommended that the PEIS identify and quantify greenhouse gas emissions associated with the Proposed Action, incorporate an energy substitution analysis, include a discussion on how reductions in greenhouse gas emissions would meet climate goals/commitments, and include as part of the NEPA analysis a discussion of foreseeable effects of future climate change on the Proposed Action and its surrounding area. They also requested that BOEM ensure that offshore wind development does not intrude on the achievement of Comprehensive Conservation and Management Plan goals, especially when considering the impacts of climate change.[142]

O.4.8 Coastal Habitat and Fauna

Two commenters provided feedback on coastal habitat and fauna issues related to the NY Bight PEIS.

One commenter asserted that the PEIS should analyze impacts on a number of listed protected species from offshore wind development affecting coastal habitats and fauna, adding that the cumulative impacts are likely to be significant and that any efforts to minimize and mitigate them should be taken. They also stated that the PEIS should discuss impacts on coastal habitat and fauna from the installation, presence, and eventual decommissioning of transmission cables, something that the Draft EIS did not do.[143]

Another commenter asked that the PEIS "identify Best Management Practices" to reduce impacts on vulnerable habitats, especially ones that may shift from the introduction of new structures and cable installation, evaluate the impacts on terrestrial vegetation, and consider "measures to prevent the spread of invasive species." They also asked that the PEIS evaluate impacts on vegetated dune/beach habitats, Coastal Erosion Hazard Areas (CEHA), and New York State (NYS) Significant Coastal Fish and Wildlife Habitats (SCFWF), providing a link to a list of the latter.[144]

O.4.9 Commercial and For-Hire Recreational Fishing

Approximately 15 commenters provided feedback on commercial and for-hire recreational fishing issues related to the NY Bight PEIS.

O.4.9.1 General Impacts

A few commenters addressed the extent to which commercial and recreational fishermen and fisheries operate in and around the NY Bight proposed lease areas and would be affected by the proposed rule. One commenter asserted that the PEIS should account for not only lease areas within NY Bight but also areas leased in the Southern New England area and all the way down to North Carolina, given that

[141] New York State.
[142] EPA.
[143] Clean Ocean Action.
[144] New York State.

commercial fishermen operate all throughout those areas.[145] Another commenter expressed concern about the effect of the construction, operation, and decommissioning of WEAs on Rhode Island commercial and charter fisheries.[146] Similarly, a commenter expressed concern about cumulative impacts on the Massachusetts fishing industry as more offshore wind projects are built on the coast.[147] One commenter asserted that the NY Bight is "one of the most important regions for both commercial and recreational fisheries on the East Coast" and referenced past comments they left on BOEM Calls for Interest and Proposed Sale Notices, asking BOEM to include any and all included fisheries information in the PEIS.[148] One commenter asserted that offshore wind development must "[safeguard] the abundance and diversity of the area's rich fisheries."[149]

One commenter referenced a number of figures showing overlap between the NY Bight leases and important fishing grounds and asked that BOEM consider their "Fisheries Mitigation Guidelines" in the PEIS in order to better develop impact minimization and mitigation standards.[150]

Some commenters echoed this concern about the impact of offshore wind development on the commercial and recreational fishing industries and generally urged BOEM to include an analysis and evaluation of cumulative impacts on fisheries and the fishing industry in its PEIS.[151] Specifically, one commenter recommended that the PEIS characterize the extent of Massachusetts fishing within the NY Bight area and evaluate potential impacts on key fishing species and thus the industry as a whole.[152] Another commenter asked that BOEM develop criteria for identifying "high-value fishing grounds" in order to better evaluate commercial fishing losses from offshore wind build-out.[153]

One commenter criticized BOEM for "deficient" previous actions on fisheries impacts and asserted that a cumulative analysis of impacts should be done on a fishery-by-fishery basis all down the coast, not simply in the NY Bight area.[154]

O.4.9.2 Specific Impacts

A few commenters stressed the importance of assessing cumulative economic impacts on the commercial fishing industry from offshore wind development, given the family-owned, community-dependent basis of many of those industries.[155] The latter commenter also stated the importance of including impacts on the recreational fishing industry, given the interconnected nature of the fishing

[145] Long Island Commercial Fishing Association.
[146] Rhode Island Coastal Resources Management Council.
[147] Massachusetts Office of Coastal Zone Management.
[148] National Marine Fisheries Services.
[149] New York Offshore Wind Alliance.
[150] Fisheries Survival Fund.
[151] Massachusetts Office of Coastal Zone Management; Responsible Offshore Development Alliance; Long Island Commercial Fishing Association; Borough of Seaside Park; Clean Ocean Action; Rhode Island Coastal Resources Management Council; K. Dreher.
[152] Massachusetts Office of Coastal Zone Management.
[153] Responsible Offshore Development Alliance.
[154] Seafreeze Shoreside, Seafreeze Ltd.
[155] Long Island Commercial Fishing Association; Clean Ocean Action; New York State.

economy off the Atlantic coast. They went on to discuss methods of analyzing economic impacts on the fishing industry, asserting that Vessel Monitoring Systems (VMS) and National Marine Fisheries Service (NMFS) data on fishing boat tracking and fish returns could best approximate catch rates and could then be used to track economic impacts of offshore wind development on the fishing industry.[156]

Similarly, one commenter stated that "spatially explicit catch and effort information" is severely lacking for the recreational fishing sector and thus is a data gap the PEIS needs to consider. They referenced survey and data mining work done by the New England Aquarium's Anderson-Cabot Center for Ocean Life as a possible blueprint for gathering future data for the PEIS.[157]

One commenter asked that BOEM "separate the analysis of commercial and recreational fisheries."[158]

One commenter expressed concern about commercial fishing losses as a result of changes in primary productivity from offshore wind development and added that the PEIS should incorporate these impacts into environmental and socioeconomic analysis, as well as the overall cumulative impacts analysis.[159]

One commenter discussed a number of impacts on commercial and recreational fishing, including displacement from typical fishing areas due to offshore wind development, potential gear loss, increased navigation time to avoid offshore wind infrastructure, and general safety concerns, asking BOEM to evaluate all of these potential impacts in the PEIS.[160]

O.4.9.3 AMMM Measures/Compensation

A few commenters generally asked that the PEIS identify AMMM measures for impacts to the commercial and recreational fishing industries.[161]

Another commenter cautioned about conflicts with fishing gear as a result of offshore wind development and stated that cable burial depth should be evaluated as a potential mitigation technique.[162]

One commenter listed a number of mitigation and compensation measures for BOEM's consideration, including measures to offset costs of supporting infrastructure, a standardized process for gear loss claims, and a "full, transparent, equitable, and science-based compensation program." They also recommended the establishment of a federal fisheries working group to manage and produce mitigation

[156] Clean Ocean Action.
[157] American Saltwater Guides Association.
[158] T. Barten.
[159] Seafreeze Shoreside, Seafreeze Ltd.
[160] New York State.
[161] Responsible Offshore Development Alliance; Fisheries Survival Fund; Massachusetts Office of Coastal Zone Management.
[162] New York State.

frameworks.[163] Another commenter added that part of the cumulative analysis should include financial mitigation to fishermen who were not included in the federal review process.[164]

Refer to Section O.4.3, *Avoidance, Minimization, Mitigation, and Monitoring (AMMM) Measures (including stipulations),* for more details on specific AMMM measures.

O.4.9.4 Collaboration

A commenter professed support for a PEIS, asserting that it would help streamline consistency between different offshore wind projects and could allow cumulative impacts to be evaluated early in the process.[165]

One commenter asked that the PEIS outline a fisheries research plan to improve coordination between developers and stakeholders.[166] Another commenter asked that BOEM require developers to “co-develop cooperative monitoring and research plans” with the fishing industry and themselves partner with the fishing industry to provide a centralized “information depository” accessible to fishermen.[167] One commenter encouraged BOEM to continue conversations with the fishing industry about gear adaptations so that they can continue fishing throughout certain times of the year.[168]

O.4.10 Cultural Resources

Four commenters provided feedback on cultural resources issues related to the NY Bight PEIS.

A commenter warned that the anchoring, cabling, and use of chains involved in offshore wind energy development could substantially impact cultural resources in the NY Bight such as submerged shipwrecks. This commenter further recommended that BOEM’s PEIS analyze these resources, the potential impacts of offshore wind development on them, and potential mitigation measures, adding that Indian Tribes should be involved in the identification of cultural resources.[169] Similarly, another commenter suggested that offshore wind development be planned with sensitivity to historic and cultural heritage of northeastern Tribal Nations.[170]

A commenter suggested an alternative to BOEM’s current guidelines for geophysical surveys with respect to potential impacts on marine archeological resources, arguing that allowing lessees to first conduct surveys at wider intervals to identify larger shipwrecks and submerged landscape features, with closer interval surveys to be conducted later within the final project footprint to identify smaller, buried

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[163] Responsible Offshore Development Alliance.
[164] Long Island Commercial Fishing Association.
[165] New England and Mid-Atlantic Fishery Management Councils.
[166] Massachusetts Office of Coastal Zone Management.
[167] Responsible Offshore Development Alliance.
[168] New York State.
[169] Clean Ocean Action.
[170] New York Offshore Wind Alliance.

marine cultural resources. The commenter further recommended that BOEM analyze approaches to avoid, minimize, and mitigate impacts on these resources.[171]

A commenter said that there are ongoing conservation initiatives in the NY Bight, including the designation process for the Hudson Canyon National Marine Sanctuary to protect cultural resources.[172]

O.4.11 Cumulative Impacts

Approximately 15 commenters provided feedback on cumulative impacts relevant to the NY Bight PEIS.

O.4.11.1 General Comments on Cumulative Impacts

A commenter warned that the cumulative impacts of offshore wind energy development in the NY Bight would be substantial.[173] Another commenter said that BOEM's PEIS should include a fair and full consideration of potential cumulative impacts of offshore wind development in the NY Bight.[174]

A commenter said that BOEM should ensure that efforts are made to avoid, minimize, and mitigate potential cumulative impacts.[175] Similarly, another commenter recommended that where potential cumulative impacts are identified, BOEM should clarify which parties should be responsible for avoiding, minimizing, and mitigating those impacts.[176]

A commenter argued that by assessing cumulative impacts and mitigation measures, BOEM may be able to identify preferrable alternative actions.[177]

O.4.11.2 Cumulative Impacts on Fisheries and Fishing

A commenter expressed support for BOEM's plan to include a PEIS in its rulemaking process, which the commenter claimed appears to be in response to the fishing industry's requests to better assess the cumulative effects of offshore wind development on fisheries.[178] Similarly, another commenter expressed support for BOEM's proposed programmatic approach, claiming that the need for cumulative impacts analyses has been posited by fishery stakeholders and scientists, and that such an approach facilitates stakeholders, such as for-hire captains and private anglers, sharing their input.[179]

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[171] Attentive Energy LLC.
[172] National Wildlife Federation et al.
[173] Wallace & Associates.
[174] Clean Ocean Action.
[175] Clean Ocean Action.
[176] Environmental Protection Agency.
[177] National Wildlife Federation et al.
[178] Responsible Offshore Development Alliance.
[179] American Saltwater Guides Association.

A commenter recommended that BOEM's PEIS articulate how cumulative impacts are considered and incorporated on a project-by-project basis and on an industry-wide scale, identify funding mechanisms and interagency collaborations, and describe mechanisms for mitigating potential fishery collapse.[180]

A couple of commenters recommended that BOEM's PEIS include an analysis of cumulative impacts on fishing operations, such as changes to time and area fished, displaced fishing effort, gear used, stresses on fisheries, and landing ports.[181]

A commenter recommended that BOEM's cumulative analysis assess economic impacts on fishermen from New York who suffered because the State did not file for federal consistency review, as well as include a revamping of NOAA's regional geographic location definition process so that all qualified regional coastal states could automatically qualify if they can prove income from relevant landings. This commenter additionally recommended that the cumulative analysis consider financial mitigation schemes that could be designed for fishermen who were not included during the federal consistency review process.[182]

Multiple commenters recommended that BOEM's cumulative analysis, with respect to impacts on fisheries, be conducted coastwide and fishery-by-fishery and take into account the impacts of existing and foreseeable future offshore wind leases, rather than only on a project-by-project basis.[183] Another commenter echoed this argument and further suggested that in its analysis, BOEM include a description of the potentially impacted resources, current trends regarding the resources, and a discussion of likely future conditions of the resources based on current conditions, trends, and foreseeable projects.[184]

O.4.11.3 Cumulative Impacts on Wildlife

A commenter said that assessing cumulative impacts, through BOEM's PEIS, is essential to understanding the overall impacts of offshore wind development on species and ecosystems, including the effects of noise and the timing of construction.[185]

Multiple commenters recommended that BOEM's PEIS include an analysis of cumulative impacts on endangered species, particularly the effects of noise. [186] Another commenter specified their concern for cumulative impacts on the North Atlantic right whale and key benthic species, claiming that there is insufficient scientific understanding of offshore wind energy development's effects on these species. [187]

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[180] Massachusetts Office of Coastal Zone Management.
[181] Rhode Island Coastal Resources Management Council; New York State.
[182] Long Island Commercial Fishing Association.
[183] Seafreeze Shoreside, Seafreeze Ltd.; New England and Mid-Atlantic Fishery Management Councils; American Saltwater Guides Association; Rhode Island Coastal Resources Management Council; New York State.
[184] Environmental Protection Agency.
[185] National Wildlife Federation et al.
[186] Environmental Protection Agency; Rhode Island Coastal Resources Management Council.
[187] Clean Ocean Action.

A commenter recommended that BOEM's cumulative impacts analysis consider effects on habitats, avian and marine mammal migratory pathways, and other ecological processes.[188]

O.4.11.4 Geophysical and Hydrodynamic Cumulative Impacts

A commenter expressed support for BOEM conducting cumulative impact analyses for the rule, particularly with regard to major oceanographic features such as the Mid-Atlantic Bight Cold Pool, which the commenter claimed is especially important for the regional benthic ecosystem and may be particularly susceptible to changes in hydrodynamics caused by wind farm structures.[189]

A commenter also suggested that the PEIS include an analysis of the potential cumulative impacts on sediment biogeochemistry from the increased volume of fecal pellets from fouling fauna and biomass falling from turbine reef structures, which lead to increases in mineralization activity, sedimentary oxygen consumption, and consequently carbon dioxide levels.[190]

Another commenter recommended that BOEM require permits for geological and geophysical surveys and conduct cumulative analyses for such permits.[191]

O.4.11.5 Other Comments on Cumulative Impacts

A commenter recommended that BOEM's PEIS include an analysis of offshore wind development's potential cumulative impacts on marine commerce.[192]

A commenter recommended that BOEM's PEIS include an analysis of the potential cumulative impacts of noise on residential and commercial buildings near port facilities.[193]

A couple of commenters recommended that BOEM consider increased vessel traffic and consequent navigational hazards in its cumulative impacts analysis.[194]

A commenter warned that offshore wind development would have cumulative adverse visual impacts on historic properties, sites, and districts listed or eligible for listing in the National Register of Historic Places, adding that because of the historic integrity of properties within the project area, and the precedent set by this rulemaking for future offshore wind development, it is important that the PEIS is complete and thorough.[195]

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[188] New York State.
[189] Fisheries Survival Fund.
[190] Clean Ocean Action.
[191] Responsible Offshore Development Alliance.
[192] Environmental Protection Agency.
[193] Environmental Protection Agency.
[194] Rhode Island Coastal Resources Management Council; New York State.
[195] Cape May County, NJ; Point O'Woods Association, Fire Island, NY.

A commenter recommended that BOEM's PEIS identify the temporal and spatial criteria necessary for its regional cumulative analysis.[196]

A commenter argued that BOEM's interpretation and tiering of the NEPA review process, as well as the bifurcation of nearby projects like Ocean Wind, Atlantic Shores, and Empire Wind, has obscured the cumulative impacts of offshore wind development. The commenter further requested clarification of the notice's claim that the PEIS will allow BOEM to address "tiering of project-specific environmental analyses."[197]

A commenter recommended that BOEM's cumulative impacts analysis consider effects on sand mining and planned resilience projects.[198]

Refer to the relevant resource sections throughout this appendix for more expansive summaries of the above topics not relating to cumulative impacts.

O.4.12 Demographics, Employment, and Economics

Approximately 10 commenters provided feedback on demographics, employment, and economics issues related to the NY Bight PEIS.

O.4.12.1 Positive Impacts on Demographics, Employment, and Economics

A commenter claimed that this initiative would help meet the Administration's, New Jersey's, and New York's clean energy goals while creating economic opportunity and tens of thousands of jobs.[199] Similarly, another commenter estimated that the development and construction of 16.5 GW of offshore wind energy off the coasts of New York and New Jersey could directly or indirectly support approximately 50,000 jobs, and that nationally reaching 30 GW by 2030 would create 83,000 jobs. This commenter further argued that BOEM has underestimated the economic benefits of offshore wind development in its past NEPA analyses by focusing on the effects on the local area and not including regional and national supply chain and economic effects, adding that project approvals in a young industry can have ripple growth effects across that industry's supply chain. Finally, the commenter said that to deny the project would have the opposite effect, disrupting supply chain investments in the wind energy industry.[200]

A commenter cited a study to claim that requiring developers to use 100 percent domestic content inputs versus 25 percent domestic content could result in a difference of 30,000–40,000 jobs created from 2023–2030.[201]

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[196] Clean Ocean Action.
[197] Clean Ocean Action.
[198] New York State.
[199] OW Ocean Winds East, LLC.
[200] American Clean Power Association.
[201] Bluegreen Alliance.

A commenter said that this initiative would help reduce greenhouse gas emissions and create a robust domestic offshore wind manufacturing sector.[202]

O.4.12.2 Negative Impacts on Demographics, Employment, and Economics

A commenter argued that given the size and visibility of the proposed project, it could cause losses of tourism revenue of up to $300 million per year, nearby property value losses ranging from $1 million to $189,000 per home, an approximately 55 percent reduction in area vacation rentals, and job losses in the hospitality sector.[203]

A commenter claimed that based on figures published by the New Jersey Board of Public Utilities, the planned developments would cause electric rates to increase in the State, with residential rates increasing 10 percent, commercial rates 15 percent, and industrial sector rates 18 eighteen, which could cause job losses. This commenter further claimed that many of the jobs the projects would create are temporary and that it is unclear how many would be held by U.S. workers.[204] Similarly, another commenter claimed that wind turbines are largely manufactured outside of the United States, which does not benefit U.S. employment.[205]

O.4.12.3 Recommendations with Respect to Demographics, Employment, and Economics

A commenter recommended that BOEM require developers to report investments in workforce training and supply chain development.[206]

A commenter suggested that BOEM consider changes that have occurred since it issued its Programmatic EIS for Alternative Energy Development in 2007 with respect to the economics of offshore wind, including: the automation of the operation and maintenance of offshore wind energy systems, which reduces potential for job creation; the relative costs of offshore wind energy and other clean energy technologies; and the reliability of wind energy in general.[207]

A commenter recommended that BOEM's PEIS include a socioeconomic impact analysis that considers electric rates and lost tourism and the offsetting benefits in terms of reduced emissions.[208]

A couple of commenters recommended that BOEM consider impacts on regional fisheries, potential lost jobs and income among commercial fishermen and recreational for-hire fishing, and higher costs to the seafood industry in general.[209]

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[202] New York Offshore Wind Alliance.
[203] K. Dreher.
[204] Save Long Beach Island, Inc.
[205] J. Binder.
[206] Aspen Institute.
[207] J. Binder.
[208] Save Long Beach Island, Inc.
[209] Responsible Offshore Development Alliance; Clean Ocean Action.

A commenter made numerous recommendations with respect to the rule's potential economic effects, including that BOEM:

- Require compensatory mitigation for fishermen for the life of the project and establish adequate reserve funds for that purpose by establishing a compensation program paid into by lessees.
- Honor compensation claims for up to 3 years after income loss, per review by fisheries experts.
- Conduct transparent impact analyses with respect to energy, economics, employment, and greenhouse gas emissions for regions and specific projects.[210]

Another commenter also made numerous recommendations with respect to the rule's potential economic effects, including that BOEM:

- Assess potentially higher costs for offshore wind energy.
- Present comprehensive mitigation and compensatory measures for unavoidable impacts.
- Clearly communicate the costs of development including siting, preconstruction, construction, operations, maintenance, and decommissioning.
- Provide information about cost protections to electricity ratepayers for potentially higher energy costs.[211]

Another commenter also made numerous recommendations with respect to the rule's potential economic effects, including that BOEM:

- Identify potential impacts on shore-based and water-dependent industries and potentially restricted port access due to increased vessel traffic and construction.
- Assess impacts on public services, populations, economy, employment, housing and property values, the reliability of electric facilities, and public safety.
- Evaluate conformity with United States Coast Guard (USCG) Marine Planning Guidelines.[212]

In order to maximize union job creation and comply with NEPA, a commenter recommended that BOEM's PEIS consider and evaluate: domestic content commitments; project labor, labor peace, and community benefits agreements; utilization of registered apprentices; protections against worker misclassification and wage theft; impacts on fisheries, in consultation with industry stakeholders; equitable access to benefits for historically underserved communities; quantity and quality of jobs created; plans to support the growth of a domestic supply chain to maximize U.S. employment; and programs necessary for expanding the domestic workforce with an emphasis on ensuring opportunities

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[210] Responsible Offshore Development Alliance.
[211] Clean Ocean Action.
[212] New York State.

for displaced energy workers. This commenter further argued that using PLAs can help avoid labor disputes, increase project efficiency, improve safety, and create opportunities for historically marginalized communities.[213]

Refer to Section O.4.9 for additional comments on commercial and for-hire recreational fishing, Section O.4.19 for additional comments on navigation and vessel traffic, and Section O.4.23 for additional comments on recreation and tourism not relating to demographics, employment, and economics.

O.4.13 Environmental Justice

Nine commenters provided feedback on environmental justice issues related to the NY Bight PEIS.

O.4.13.1 Environmental Justice Benefits

A commenter stated that offshore wind development could create environmental justice benefits.[214] Another commenter concurred and specified that these benefits could include reducing the environmental and public health burden of fossil fuel generation on frontline communities.[215]

O.4.13.2 Environmental Justice Concerns

A commenter claimed that the impacts of offshore wind development they foresee, including noise, light pollution, air emissions from vessels, reduced access to coastal areas, loss of wetlands, loss of employment in marine industries, and increased stormwater runoff from new parking lots and roads, would be amplified for environmental justice communities.[216]

A commenter warned that people who live and invest in nearby ocean communities would be negatively impacted by this rule, with the quality of the ocean degrading, European developers earning money at their expense, and local livelihoods declining.[217]

O.4.13.3 Process Recommendations for Achieving Environmental Justice

Several commenters recommended that BOEM consider issues of environmental justice in this rulemaking process.[218] More specifically, a commenter recommended that BOEM incorporate environmental justice concerns raised in New York's Climate Act, consider impacts on disadvantaged communities (DACs) and potential mitigation measures for those impacts, and analyze increased air emissions and other impacts in Potential Environmental Justice Areas.[219] Another commenter recommended that BOEM use EPA's Environmental Justice Screening and Mapping Tool to consider

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213 Bluegreen Alliance.
214 American Clean Power Association.
215 New York Offshore Wind Alliance.
216 Clean Ocean Action.
217 Wallace & Associates.
218 Mayor John A Peterson, Jr.; OW Ocean Winds East, LLC.
219 New York State.

possible impacts on vulnerable adjacent communities; and noise, air, lighting, and traffic impacts from construction and project operations on populations surrounding facilities.[220]

A commenter claimed that they identified DAC representatives from New York and New Jersey who desired earlier engagement in the present rulemaking process, in addition to increased transparency and accountability. By engaging these stakeholders later in the process, this commenter reasoned, their ability to provide valuable feedback is limited because they have had limited exposure to the process. This commenter further recommended that BOEM hold at least one roundtable with DAC stakeholders during the preparation of the PEIS; use these meetings as opportunities to educate DACs on the leasing process, explain the role of the PEIS in the process, identify key concerns and recommendations from DACs, and help build the capacity of DACs to engage overall; share these meetings' agendas, attendance rosters, and summaries of recommendations; and require developers to track and report percentage of the benefits of investments in workforce training and supply chain development going to DACs, which would facilitate understanding how offshore wind development affects DACs and encourage developers to more intentionally consider how DACs are affected by development. Finally, this commenter suggested that BOEM can find sample guidance for such investment monitoring benchmarks from New York State Energy Research & Development Authority's (NYSERDA) 2022 Offshore Wind Solicitation, under which bidders must present their own monitoring framework and ensure that it is verified by a third party. [221]

A commenter requested that if BOEM believes that the closure or displacement of fossil fuel facilities is beneficial for nearby communities and that this will occur if offshore wind energy is developed in the area, that the PEIS present evidence supporting these positions.[222]

O.4.14 ESA-Listed Species

Five commenters provided feedback on the NY Bight PEIS related to ESA-listed species.

O.4.14.1 Potential Impacts on Endangered Species and Mitigation Measures

A commenter stated that the NY Bight is used by a number of species listed under the ESA, including fish, sea turtles, and marine mammals.[223] This commenter further recommended that BOEM monitor protected species during wind farm construction and analyze and develop approaches to construction that will minimize impacts on protected species, particularly with regard to reducing noise from pile-driving, dealing with unexploded ordinances, managing vessel traffic at night and in low visibility conditions, avoiding construction during sensitive times of the year, requiring practices to minimize entanglement, mandating routine cleanups, and choosing cable installation methods that minimize impacts. The commenter also recommended that BOEM require adherence to best management practices to limit capture, entanglement, injury, and mortality of protected species in biological surveys

[220] Environmental Protection Agency.
[221] Aspen Institute.
[222] Clean Ocean Action.
[223] National Marine Fisheries Services.

and that protected species do not interact with gear such as anchor and buoy lines. Additionally, the commenter recommended that dredging activities be subject to seasonal restrictions based on dredge types and possible risks to listed species.[224]

A commenter warned that increased vessel activity and noise from offshore wind development in the NY Bight would be an existential threat to the endangered North Atlantic right whale, of which the commenter claimed only 336 remain. This commenter further recommended that no construction or other offshore wind activity be allowed in the NY Bight during the whale's most sensitive times of the year, including migration periods.[225] Another commenter similarly expressed concern for the project's potential impacts on North Atlantic right whales, adding that they are a particularly valuable and beautiful species.[226] Refer to Section O.4.18 for additional comments on marine mammals.

A commenter recommended that BOEM evaluate year-round northern long-eared bat activity in the vicinity of the proposed action and potential impacts on the species, including tree clearing during construction.[227]

O.4.14.2 Other Process Recommendations with Respect to Endangered Species

A commenter recommended that BOEM identify surveys for rare, threatened, and endangered species along all considered project routes; assess potential impacts on those species along those routes; and consider avoidance, minimization, and mitigation measures with respect to those potential impacts.[228]

A commenter recommended that BOEM consult with the United States Fish and Wildlife Service (USFWS) on potential impacts on aquatic and terrestrial species, in accordance with Section 7 of the ESA.[229]

O.4.15 Finfish, Invertebrates, and Essential Fish Habitat

Eight commenters provided feedback on finish, invertebrates, and essential fish habitat issues related to the NY Bight PEIS.

A commenter requested that BOEM include a consideration of fish habitats as part of its rulemaking process and warned that effects on them from offshore wind development in the NY Bight could be significant.[230] Another commenter requested information about studies of offshore wind development's

[224] National Marine Fisheries Services.
[225] Clean Ocean Action.
[226] Mayor John A Peterson, Jr.
[227] New York State.
[228] New York State.
[229] Environmental Protection Agency.
[230] Mayor John A Peterson, Jr.

effects on fish.[231] Another commenter argued that not enough data is available to fully understand the effects of offshore wind development on finfish and invertebrates.[232]

A commenter claimed that areas of the NY Bight are designated as essential fish habitat for nearly every life-stage of every species managed by the New England and Mid-Atlantic Fishery Management Councils and NMFS, as well as many managed by the South Atlantic Fishery Management Council.[233]

A commenter recommended that BOEM identify current stock status for different species of fish and invertebrates, as well as migration routes, life history stages, and egg and larval seasonality and abundance. This commenter further recommended that BOEM identify essential fish habitat, including spawning, recruitment, and nursery areas, as well as food web interactions. [234]

A commenter claimed that the NY Bight is home to and essential habitat for numerous species, including sea scallops, Atlantic surf clams, ocean quahogs, longfin squid, Atlantic cod, black sea bass, blue fish, and summer flounder.[235] Similarly, another commenter expressed particular concern for sea scallop, surf clam, and ocean quahog populations in and around the NY Bight, which the commenter claimed are particularly important for the seafood industry, and suggested that BOEM designate additional funding for research on potential mitigation measures to protect these species from any possible impacts from offshore wind development.[236]

Several commenters warned that many features or potential accidents arising from offshore wind development could impact finfish, invertebrates, and essential fish habitat, including mid-water structures, noise, EMFs, construction, pile-driving, vessel traffic, foundation lighting, thermal discharges, and oil or other lubricants spills, and that BOEM should analyze the potential impacts of these factors. [237] One of these commenters further warned that such factors could cause changes in migration routes and migratory behavior of migratory fish species, as well as potentially altering local and regional hydrodynamics, which could impact fish and invertebrate settlement, recruitment, and connectivity.[238]

A commenter recommended that BOEM expand NMFS's role in project monitoring and essential fish habitat consultations, as well as giving greater deference to its expertise in these areas.[239] Another commenter recommended that BOEM work with NOAA, State governments, and Tribal Nations to designate marine sanctuaries in the NY Bight.[240]

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[231] Twin Lights Historical Society.
[232] Clean Ocean Action.
[233] National Marine Fisheries Services.
[234] New York State.
[235] Clean Ocean Action.
[236] NJDEP.
[237] National Wildlife Federation et al.; New York State; Clean Ocean Action.
[238] National Wildlife Federation et al.
[239] Responsible Offshore Development Alliance.
[240] National Wildlife Federation et al.

O.4.16 Geological, Geophysical, and Biological Bathymetric Conditions

One commenter provided several recommendations for BOEM regarding geological, geophysical, and biological bathymetric conditions, including that BOEM should:

- Identify sediment quality, type and chemistry within lease areas and along potential cable corridors.
- Evaluate micro-gyres and circulation changes around structures to evaluate scouring and sedimentation from turbine bases and cables and effects on cable burial from coastal processes and storms.
- Evaluate air circulation changes from turbines and sea surface temperature impacts to assess seafloor disturbances from turbine structures and cables.
- Assess seafloor disturbances from construction methodologies such as anchoring, dredging, and seafloor leveling.
- Evaluate cable burial depths necessary to avoid EMF impacts, conflicts with fishing gear, and anchor strikes.
- Evaluate habitat changes from turbine and cable installation, including boulder relocation and seafloor leveling.[241]

O.4.17 Land Use and Coastal Infrastructure

Four commenters provided feedback on land use and coastal infrastructure issues related to the NY Bight PEIS.

A commenter claimed that there is insufficient scientific data on the effects of the construction of the necessary supporting infrastructure for offshore wind energy development.[242]

A commenter warned that this initiative could cause substantial onshore land use impacts from land disturbance, port utilization, cabling routes, and transmission infrastructure, as well as new port areas, parking lots, and structures. This commenter further recommended that BOEM's PEIS estimate the total onshore acreage required for construction, manufacturing, assembly, transportation, operations, and maintenance, as well as disclose rezoning and reclassification and requirements. This commenter added that onshore land disturbance could have effects on stormwater collection and management, and consequently the PEIS should consider this effect in flood-prone areas. Additionally, the commenter recommended that the PEIS evaluate impacts from the use of pesticides, herbicides, and other chemicals in onshore project areas, and that BOEM should require green infrastructure methods in

[241] New York State.
[242] Mayor John A Peterson, Jr.

project development. Finally, the commenter warned that the developments could impact wetlands in the region.[243]

A commenter provided several recommendations for BOEM regarding land use and coastal infrastructure, including that BOEM:

- Evaluate potential temporary and permanent impacts on land use from siting new infrastructure, including docks, piers, and shoreline stabilization.
- Evaluate potential impacts on vegetated dune and beach habitats; consider impacts on CEHA.
- Avoid disturbing sand borrow areas and beach nourishment activities.
- Provide details on how environmental impacts from operational, maintenance, and port facilities will be analyzed.
- Consider the existing capacity or need for additional capacity of onshore cable for accepting additional power.[244]

A commenter suggested that BOEM adopt as a goal the improvement land use planning to protect soil function, water quality, water supply, and living resources.[245]

O.4.18 Marine Mammals

Approximately 10 commenters provided feedback on issues related to marine mammals in the NY Bight PEIS.

A couple of commenters claimed that the NY Bight is home to numerous species of marine mammals, some of which are endangered, including: sei, blue, fin, humpback, sperm, and northern right whales; harbor porpoises; bottlenose dolphins; harbor seals; and West Indian manatees.[246] Several commenters warned the offshore wind development could impact such marine mammals in the NY Bight and that BOEM should consider these impacts.[247] One of these commenters added that there has been insufficient research to date on these impacts.[248]

Many commenters warned of the potential effects that features and accidents arising from offshore wind energy development could have on marine mammals and requested that BOEM analyze these impacts and consider potential mitigation measures; these factors included: noise, vessel traffic and strikes, EMFs, in-water structures, sedimentation from land and seabed disturbances, trash, oil spills, pile-driving, dredging, cable laying, drilling, turbine operation, intakes and discharges related to cooling

[243] Clean Ocean Action.
[244] New York State.
[245] Environmental Protection Agency.
[246] National Park Service; Clean Ocean Action.
[247] Mayor John A Peterson, Jr.; New York Offshore Wind Alliance; National Park Service; Clean Ocean Action.
[248] Clean Ocean Action.

offshore wind conversion stations, altered micro-climates, altered hydrodynamics, and prey entrainment.[249]

A commenter requested that BOEM identify seasonal distribution, abundance, and migration routes for marine mammals.[250] Another commenter recommended that the PEIS report the results of recent and ongoing marine mammal surveys in the NY Bight and report how developers will work together and with the research community to improve understandings of mitigation measures.[251]

Several commenters suggested BOEM devote particular attention to the endangered North Atlantic right whale and potential impacts to the species.[252] Another commenter echoed this concern, additionally claiming that fewer than 340 of the whales remain, with the NY Bight being part of their migratory corridor. This commenter argued that vessel traffic and noise exacerbate pressures on this population and that the PEIS should account for potential impacts on the species. This commenter further recommended that no construction or other offshore wind activity be allowed in the NY Bight during the whale's most sensitive times of the year, including migration periods.[253] Similarly, another commenter recommended that noisy construction activities only occur during the day and good weather conditions to maximize visual detection probability for the whales; this commenter further argued that even a single vessel strike on a North Atlantic right whale is an unacceptable risk given their status.[254]

Another commenter suggested considering no-build migratory routing measures for protected species like the North Atlantic right whale.[255] Similarly, another commenter expressed concern for potential impacts on the North Atlantic right whale's migration corridors from noise from turbines, including preventing migration and causing injury or death by interfering with the whales' ability to communicate. Furthermore, the commenter claimed that one possible reaction of whales to such a disturbance is to swim just beneath the surface, which increases the likelihood of vessel strikes.[256] Refer to Section O.4.14 for additional comments on ESA-listed species.

O.4.19 Navigation and Vessel Traffic

Approximately 10 commenters provided feedback on navigation and vessel traffic issues related to the NY Bight PEIS.

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[249] National Wildlife Federation et al.; Clean Ocean Action; Massachusetts Office of Coastal Zone Management; National Park Service; New York State.
[250] New York State.
[251] Massachusetts Office of Coastal Zone Management.
[252] J. Binder; National Wildlife Federation et al.; K. Dreher; New York Offshore Wind Alliance.
[253] Clean Ocean Action.
[254] National Wildlife Federation et al.
[255] Responsible Offshore Development Alliance.
[256] Save Long Beach Island, Inc.

O.4.19.1 General Comments on Navigation and Vessel Traffic

Multiple commenters warned that offshore wind energy development in the NY Bight could increase vessel traffic. [257] One of these commenters added that this could impact marine mammals and sea turtles.[258] Another commenter warned that offshore wind development in the NY Bight would pose a threat to navigational safety for all commercial vessel traffic in the area.[259]

O.4.19.2 Specific Comments on Risks Posed by Increased Vessel Traffic

A commenter warned that offshore wind development in the NY Bight could interfere with marine radar, causing navigational safety risks, and cited a study to dispute BOEM's position that solid state and Doppler-based radars are adequate solutions to these impacts.[260] A couple of other commenters similarly expressed concern for the potential effects on marine radar.[261]

A commenter warned that wind farm construction could cause traffic impacts from construction vessels transporting turbine parts, from vessels exporting cable and upland infrastructure, and from the use of ports and operations and maintenance facilities.[262]

Another commenter expressed additional concerns about the effects of wind energy leasing in the NY Bight on navigation and vessel traffic, including:

- The scour protection employed by the developments could cause vessels' anchors to fail to hold and that interactions between anchors and cables could damage either.
- Turbines could increase collision risks with slow-moving maintenance vessels and by creating reefs that attract fishermen.
- Increased congestion and navigational complexity would increase crew fatigue, damage to vessels, injuries to crews, fuel spills, and engagement of USCG rescue teams.
- The development would significantly impact port utilization, increasing competition for berthing space and port services in the area and potentially further complicating national supply chain issues.[263]

A commenter warned that large vessel collisions in or around the lease areas could cause substantial environmental damage, and the emergency response and clean-up could severely restrict shipping lanes, causing significant economic impacts.[264]

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[257] National Wildlife Federation et al.; Mayor John A Peterson, Jr.
[258] National Wildlife Federation et al.
[259] World Shipping Council.
[260] Seafreeze Shoreside, Seafreeze Ltd.
[261] Long Island Commercial Fishing Association; Clean Ocean Action.
[262] New York State.
[263] Clean Ocean Action.
[264] World Shipping Council.

O.4.19.3 Recommendations with Respect to Navigation and Vessel Traffic

Turbine Spacing and Lane Markings

A commenter recommended that BOEM require that wind farms be organized in straight rows and columns, in a grid pattern, to facilitate navigation safety, consistent marking and lighting, search and rescue, and safe commercial fishing. The commenter further recommended that when multiple wind projects share a border, lessees be required to adopt the same spacing and layout across borders to present a single wind farm with consistent straight-line routes. If this is not possible, the commenter recommended that space be left between borders to provide a clear delineation, or that clear markings be applied to warn mariners of changes in spacing or orientation. Finally, the commenter said that all mooring systems and ancillary equipment should be confined to the lease areas.[265]

Similarly, another commenter recommended that transit corridors be established through proposed wind farms and turbine arrays, and that the PEIS consider alternative layouts and provide information on navigational risks and mitigation measures.[266] Another commenter similarly suggested that BOEM analyze spacing patterns between turbines and other infrastructure that could either allow fishing to continue or preserve more structure-free areas.[267]

Buffer Zones

Several commenters argued that around offshore wind energy development near port approaches, there should exist a minimum buffer zone of 2 nautical miles from the parallel outer or seaward boundary of a traffic lane and of 5 nautical miles from the entry or exit of traffic separation schemes.[268] One of these commenters argued that such a buffer zone is necessary for vessels to detect each other visually and by radar, to allow large vessels to maneuver during an emergencies, and to accommodate the “swing circles” of large anchored vessels. These commenters found that lease blocks included in the proposal fall within this such appropriate buffer zones around nearby port approaches.[269]

Accommodating United States Coast Guard Designations

A commenter suggested that BOEM consider referencing port access route studies to mitigate navigation safety risks from offshore wind energy installations. This commenter also suggested that BOEM consider the future uses of the “Ambrose anchorage,” an offshore area used by ships awaiting inshore anchorages or berths, located 3 nautical miles south of Long Beach, New York, which is the subject of a USCG Notification of Inquiry and is under consideration for the establishment of an anchorage ground. Furthermore, this commenter suggested that BOEM adopt the Marine Planning

[265] US Coast Guard.
[266] Massachusetts Office of Coastal Zone Management.
[267] Responsible Offshore Development Alliance.
[268] World Shipping Council; The American Waterways Operators.
[269] World Shipping Council.

Guidelines detailed in the Navigation and Vessel Inspection Circular 01-19 with respect to AMMM measures.[270]

Multiple commenters said that one of the proposed lease areas, assigned to Mid-Atlantic Offshore Wind LLC, conflicts with USCG's proposed NY Bight cut-across fairway, which, if developed, would create navigation hazards in the NY Bight; consequently, the commenters argued that this area should not be developed or that BOEM should comprehensively analyze the associated vessel traffic impacts.[271]

Marine Radar

Multiple commenters recommended that BOEM's PEIS include an analysis of potential impacts on marine radar, impacts that could interfere with search and rescue capabilities, and further suggested that USCG be given a role in assessing this risk and considering potential mitigation measures.[272] Another commenter echoed this concern about impacts on marine radar and the need for mitigation measures.[273]

Liability

A commenter questioned how BOEM intends to manage allision and height hazards, if BOEM plans to include safety zones, and if BOEM plans to hold vessels liable for collisions. This commenter further recommended that BOEM analyze the potential economic impacts of marine insurance companies raising premiums or denying coverage to operators in the area in response to increased vessel navigation risks.[274] Another commenter echoed the importance of BOEM addressing operator liability.[275]

Other Recommendations

A commenter provided several recommendations for BOEM regarding navigation impacts, including that BOEM:

- Evaluate risk from vessel allisions, collisions, and groundings.
- Assess impacts from displacement of traffic.
- Analyze risk to smaller vessels during construction.
- Assess conflicts with concrete mattresses and scour protection measures.
- Assess impacts of cable exposures.

[270] US Coast Guard.
[271] The American Waterways Operators; Clean Ocean Action.
[272] Seafreeze Shoreside, Seafreeze Ltd.; Responsible Offshore Development Alliance.
[273] New York State.
[274] Seafreeze Shoreside, Seafreeze Ltd.
[275] New York State.

- Develop a plan for mariner communications and conduct routine check-ins with the New York/New Jersey Harbor Safety, Navigation, and Operations Committee to promote mariner safety.
- Identify best practices to minimize disruption to fishing from boulder relocation.
- Explore adapting mobile gears to navigate tighter corridors and continue engaging stakeholders regarding such equipment. [276]

A commenter recommended that BOEM study navigation with NMFS and USCG, work closely with USCG and relevant experts to improve safety in the area, develop safety mitigation measures, and include stakeholders in developing navigational aids such as lighting and markings.[277]

A commenter recommended that BOEM consider safety measures for vessel operations at night and in other low visibility conditions, consider approaches to minimize daily vessel traffic, and chart and communicate the placement of equipment and relocation of boulders to reduce the potential for allisions and gear damage. The commenter also recommended that the PEIS provide for communication and engagement with fishing industry members regarding the timing and duration of survey and construction activities before they commence.[278]

O.4.20 Noise

Six commenters provided feedback on noise as it relates to the NY Bight PEIS.

Some commenters discussed noise-related issues in their submissions, mostly regarding how noise from offshore wind projects might impact marine species. One commenter expressed concern regarding the impact of noise on marine life and fisheries.[279] Another commenter requested the region-wide examination of underwater noise on wildlife populations.[280] One commenter requested the provision of ambient noise levels for the Proposed Action, evaluation of potential sound penalties for onshore tonal noise impacts, assessment of the adequacy of proposed mitigation measures, evaluation of the impacts of offshore wind activities on marine mammals, and consideration of vibration-related impacts.[281] One commenter said that the PEIS should fully evaluate the consequences of pile-driving activities on marine mammal species, specifically stating that the PEIS should address the research gap on baleen whales and pile-driving; consider mysticetes and odontocetes in the PEIS; assess the impact of acoustic masking on marine mammal reproduction; and assess the impacts of persistent noise on marine mammals.[282]

One commenter stated that the scope of the PEIS should be expanded to include the New Jersey Wind Energy Area to account for cumulative impacts from turbine operational noise, citing concerns about

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[276] New York State.
[277] Responsible Offshore Development Alliance.
[278] National Marine Fisheries Services.
[279] Mayor John A Peterson, Jr.
[280] New Jersey Offshore Wind Coalition.
[281] New York State.
[282] Clean Ocean Action.

impacts on North Atlantic right whale.[283] This commenter reviewed and cited research and submitted detailed analyses to support their position. The commenter suggested that the PEIS should contain estimates of elevated underwater noise levels based on studies they referenced and criticized BOEM for not including noise estimates from larger turbines. The commenter requested that the PEIS disclose the drive type of the turbines to be used for the projects and discussed their own analysis of research and its implications for expected turbine noise levels on masking North Atlantic right whale communication. They suggested that the PEIS should address how this masking from cumulative turbine operational noise could impact their migration capabilities.

Citing research on the adverse effects on marine wildlife from pile-driving noise, another commenter stated that “the installation of gravity-based or suction bucket (or ‘caisson’) foundations represents a ‘best practice’ in the context of the mitigation hierarchy.” [284] The commenter suggested that BOEM should coordinate with NMFS to characterize source noise levels during installation of foundations and use this information to ensure that installation mitigation and monitoring protocols are maximally protective. The commenter also urged BOEM to couple their foundation choice with a long-term monitoring program. The commenter suggested that BOEM design monitoring requirements to evaluate noise propagated through substrate during pile-driving by Rayleigh waves and their impacts on benthic invertebrates and demersal fish. The commenter also expressed concern about the impact of pile-driven bases of wind turbines impacting benthic creatures and suggested that mitigating this impact “would require acoustically decoupling the mast from the pile-driven base, or if the mast is below the waterline, acoustically decoupling the turbine from the mast.” They recommended BOEM include monitoring measures and adaptive management considerations for these issues in the PEIS.

This same commenter recommended using scientific information on the presence of marine mammals, especially the North Atlantic right whale, along with monitoring and mitigation systems to minimize impacts on these species. The commenter stated that no marine mammal species should be present in the Clearance Zone and that developers should only undertake pile-driving activities during times of good visibility or while using infrared technologies for visual monitoring. They also stated that pile-driving activities “should be commenced at least 1.5 hours before civil sunset” and that “lessees should not employ 24-hour pile driving.” The commenter discussed research and made specific recommendations about minimizing noise impacts, including requiring developers to use “the best commercially available combined NAS technology” and recommended soft-start procedures for pile-driving. The commenter cited research and commented on the impacts of vessel-related noise during wind farm construction, specifically noise produced by dynamic positioning systems, stating that BOEM should analyze these effects for individual projects and cumulatively. The commenter also recommended the use of “direct-drive turbines as opposed to turbines with a gear box” to minimize operational noise and impacts to marine species.

283 Save Long Beach Island, Inc.

284 National Wildlife Federation et al.

O.4.21 Oceanography

Seven commenters discussed issues related to oceanography in the NY Bight PEIS.

Several commenters expressed concern specifically about the impact that wind farms might have on the Mid-Atlantic Cold Pool.[285] Once commenter called for considering the impacts on the Mid-Atlantic Cold Pool cumulatively by accounting for the impacts of nearby wind farms and cited research suggesting that it was particularly vulnerable to hydrodynamic changes from wind farm structures.[286] Citing research, another commenter expressed concern about the cumulative impacts of wind turbines on the Cold Pool and subsequent effects on scallops, surf clams, the ocean food web, marine habitats, and migratory patterns on the mid-Atlantic Shelf.[287]

Other commenters discussed various other topics related to ocean ecology. One commenter stated the need to consider and evaluate currents, bathymetry, microclimates, and MetOcean data.[288] Additionally, the commenter called for the evaluation of micro-gyres; circulation changes around structures; scouring and sedimentation from turbine bases, cables, and scour protection; air circulation changes and sea surface temperature impacts; and assessment of seafloor and land disturbances from various wind farm construction and operation activities. This commenter also called for the evaluation of impacts on a variety of biological resources related to ocean and coastal habitats including identifying best management practices to reduce risks to the oceanic environment. Another commenter stated that the sea surface microlayer may be compromised due to wind farm activities.[289] This commenter also expressed concern about the impact of wind turbines on wakes, stating that the PEIS should include analyses of how the wake effect would be avoided at the six lease sites. The commenter listed several concerns they suggested should be included in the PEIS including microclimate effects of turbines such as turbulence, impacts on water temperature, and impacts on the sea surface microlayer. Additionally, the commenter stated that cooling offshore wind conversion stations could impact marine mammals through their intakes and discharges and suggested that the PEIS should prioritize the analysis of this issue.

Some commenters discussed impacts on marine life due to oceanographic changes. Citing research, a couple of commenters expressed concern about the impact that wind farms might have on the ecology of the area and commercial fishing and wakes.[290] One commenter expressed concern about the impact of large turbine arrays on wind and ocean current patterns and the resulting impacts on scallops.[291] The commenter stated that wind farms will alter patterns of scallop larval settlement and generally degrade the seabed environment.

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[285] Fisheries Survival Fund; Save Long Beach Island, Inc.; New York State; Seafreeze Shoreside, Seafreeze Ltd.; Wallace & Associates; Clean Ocean Action.
[286] Fisheries Survival Fund.
[287] Save Long Beach Island, Inc.
[288] New York State.
[289] Clean Ocean Action.
[290] Wallace & Associates; Seafreeze Shoreside, Seafreeze Ltd.
[291] Fisheries Survival Fund.

One commenter stated that relying on historical data for future "blue economy" planning is no longer reasonable given the rapidly changing nature of the ocean and that planning should therefore be based on future ocean conditions.[292]

O.4.22 Other Uses

Three commenters provided feedback on other uses relevant in the NY Bight PEIS.

One commenter called for an analysis of preconstruction surveys, suggesting that this would "facilitate the National Oceanic and Atmospheric Association's (NOAA) review, improve permitting efficiencies and consistency across projects, and ensure projects have sufficient time to collect at least two (2) years of baseline data."[293] The commenter also urged BOEM to minimize disruptions to State and federal fisheries surveys through coordination with NOAA NMFS. They further called for the identification of U.S. Military training and exercises. Another commenter encouraged BOEM and developers to consider engaging with the fishing community during surveys as part of safety planning and risk identification.[294]

O.4.23 Recreation and Tourism

Seven commenters provided comments on recreation and tourism issues relevant to the NY Bight PEIS.

Some commenters expressed general concerns about the negative impacts that offshore wind projects may have on tourism economies, including lost revenue for businesses and jobs, and impacts on recreation.[295] One commenter asked if studies had been conducted investigating the impact on tourism and local economies due to turbines being visible from the shoreline.[296] Another commenter discussed the importance of tourism to the Fire Island National Seashore and Gateway National Recreation Areas.[297] A commenter also recommended evaluating measures to maintain public access and coastal use, tourism and recreational activities, and avoiding construction during peak tourism periods.[298] The commenter also mentioned that their respective Department of State had developed datasets for offshore diving and surfing areas important to their State and provided links to the datasets.

O.4.24 Scenic and Visual Resources

Approximately 10 commenters provided comments on scenic and visual resources.

Several commenters mentioned scenic and visual resources. Some commenters expressed general concern about and called for consideration regarding the visibility of wind turbines.[299] One commenter called for the elimination of visual assessments, stating that with the exception of Lease Area 544, the

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[292] Robert Griffin.
[293] New York State.
[294] NJDEP.
[295] Long Island Commercial Fishing Association; Mayor John A Peterson, Jr.; James Binder; Kimberly Dreher.
[296] Twin Lights Historical Society.
[297] National Park Service.
[298] New York State.
[299] New York State; Twin Lights Historical Society; Kimberly Dreher; James Binder.

NY Bight lease areas are more than 40 miles from the nearest shoreline.[300] A commenter stated that the PEIS should address the visual impacts of turbines, such as which communities or parks they would be visible from, the extent to which turbines would be visible, the weather conditions in which they would be visible, and how often the turbines would be visible throughout the year.[301]

Some commenters discussed how wind turbines might impact historic sites. One commenter stated that the PEIS should evaluate the cumulative impacts of new leasing areas and the Empire Wind Projects on "the uninterrupted sea view from the seven ocean-front historic districts and 31 miles of ocean beaches, dunes and water" and specified key observation points from the Gateway National Recreation Area to be included in the assessment.[302] The commenter recommended the same for visual impacts at Fire Island, similarly including key observation points for analysis and suggesting that their staff can assist with more detailed discussions on these topics. The commenter further recommended the inclusion of the Empire State Building, Green-Wood Cemetery, and Twin Lights Historic Site as National Historic Landmarks in the PEIS along with assessment of potential visual impacts.

One commenter recommended that BOEM "further define the 'historic maritime setting' in the PA or in subsequent guidance."[303] Additionally, the commenter encouraged BOEM to "ensure that the PA recognize that impacts from NYB projects on historic properties will vary significantly and are dependent on location of the turbines and export cables" and further recommended the development of a "consistent metric by which NHPA [National Historic Preservation Act] effects determinations are made across all NYB [NY Bight] projects." Another commenter suggested that they did not understand how BOEM would model visual assessment in the Cape May County and Point O'Woods areas.[304] The commenter stated that all historic districts, National Historic Landmarks, and properties listed or eligible for inclusion in the National Register of Historic Places should be included in vantage point simulations and specifically requested the inclusion of the Cape May Historic District and Point O'Woods. They also called for the consideration of lighting impacts on the night sky. Another commenter suggested that a turbine exclusion zone of at least 17.2 miles should be established in the Beach Haven Historic District to minimize adverse visual impacts on historic resources.[305]

O.4.25 Sea Turtles

Three commenters provided comments on sea turtles.

A few commenters mentioned sea turtles. One commenter recommended that the PEIS include a threat analysis matrix for endangered sea turtles living in the NY Bight area and cumulative impacts.[306] The commenter further recommended prioritizing "research to fill gaps in baseline data on sea turtle distributions, abundance, habitat use, and movements above stressor-specific investigations of effect to

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[300] Ted Barten.
[301] EPA.
[302] National Park Service.
[303] Attentive Energy LLC.
[304] Cape May County, NJ; Point O'Woods Association, Fire Island, NY.
[305] Borough of Beach Haven.
[306] Clean Ocean Action.

turtles, such as artificial reef effects, entanglements, vessel strike, or EMF." The commenter additionally stated there is no empirical data on noise threshold levels that would impact sea turtles and that the PEIS should consider the impacts on threshold shift and suggested that the PEIS should require the development of best practices by developers to minimize impacts on sea turtles. Another commenter called for consideration of the cumulative impact of wind project construction and operations on sea turtles, including noise, vessel traffic, EMF, and recommended visual and acoustic monitoring to detect sea turtles so construction can be avoided when they are present.[307] One commenter requested the identification of seasonal distribution, abundance, and migration routes of sea turtles and the evaluation of behavior and physiological impacts from vessel traffic, noise, foundation lighting, and EMF.[308]

O.4.26 Water Quality

Four commenters provided comments on water quality.

One commenter called for a review of the impacts of offshore wind on water quality.[309] Another commenter called for the evaluation of several factors related to sediment and deposition effects caused by offshore wind activities in the NY Bight area.[310] This commenter called for consideration of water quality impacts including considering New York State Water Quality Standards, modeling of the extent and duration of turbidity impacts, evaluation of changes to dissolved oxygen or nutrients in the overlying water column, and evaluation of cooling water intake structures on circulation and temperatures. The commenter further called for assessing the impacts of inadvertent spills, evaluation of methods for managing debris and waste, and considering impacts from cable heat transfer.

One commenter suggested that if vessels originating in foreign ports will be used during construction or maintenance of the wind farm projects, the PEIS should explain how they will prevent the discharge of ballast water to prevent the introduction of nonnative marine organisms.[311] The commenter expressed concern that discharge of pollutants may require National Pollutant Discharge Elimination System authorization and further recommended that the PEIS address whether the project will result in the discharge of pollutants into the water. This commenter also requested that BOEM consider the goals of the Comprehensive Conservation and Management Plan for the Barnegat Bay-Little Egg Harbor Estuary (e.g., water quality, water supply, living resources, and land use), which the Clean Water Act has designated an estuary of national significance.

A commenter called for the PEIS to fully investigate potential impacts of wind farm activities on ecologically important waterways and coastal habitats, drawing special attention to the New York/New Jersey Harbor Estuary, Peconic Bay Estuary, Barnegat Bay Estuary, Hudson Bay Estuary Program, Long Island South Shore Estuary Reserve, Hudson River National Estuarine Research Reserve, and Jacques

307 National Wildlife Federation et al.
308 New York State.
309 Mayor John A Peterson, Jr.
310 New York State.
311 EPA.

Cousteau National Estuarine Research Reserve.[312] The commenter also stated that the PEIS should "evaluate worst case scenarios to determine impacts and assure emergency response capabilities will be available to ensure water quality" should vessel collisions cause a spill. The commenter suggested that the PEIS evaluate all risks and mitigation plans to account for the possibility of oil spills due to collisions. The commenter stated that it is likely the case that current design specifications (e.g., related to corrosion, corrosion protection) may not "capture the corrosivity of the environment, likely rendering impacts far different from any kind of assessments," and that industry codes for wind energy are not yet fully developed.

O.4.27 Wetlands and Other Waters of the United States

Three commenters provided comments on wetlands and other water resources in the United States.

A few commenters mentioned wetland and other water topics. One commenter stated that Executive Order 11990 Protection of Wetlands requires federal agencies to minimize degradation of wetlands and recommended the implementation of best management practices to comply with this directive.[313] They further suggested that the PEIS should assess impacts "that could result in a change (either permanent or temporary) of cover type within a wetland." This commenter additionally stated that impacts on streams and wetlands should be avoided or minimized in accordance with Section 404 of the Clean Water Act, that aquatic resources in the area should be delineated according to the 1987 Corps of Engineers Wetlands Delineation Manual and Regional Supplement. and that an evaluation of "cumulative effects of onshore activities at a watershed scale (i.e., hydrologic unit code 12) be provided to ensure that measures are undertaken to avoid and minimize the potential of cumulative impacts."

Citing research and discussing the importance of wetlands, another commenter called for the PEIS to identify and evaluate the potential impacts on wetlands due to wind energy development in the NY Bight and consider how impacts could be avoided and minimized.[314] The commenter also mentioned Executive Order 11990 and Section 404 of the Clean Water Act and stated that the PEIS must go beyond acknowledging the importance of wetlands and identify mitigation measures. The commenter suggested a testing a pilot project to improve data on wind energy development before undertaking industrial-scale development. Another commenter called for evaluating potential impacts of transmission installations on wetlands, inland waters, and their species; evaluating the impacts of clearing vegetation near "designated Wild, Scenic, & Recreational Rivers (WSR) and NYS Significant Coastal Fish and Wildlife Habitats (SCFWF)"; and evaluating impacts on freshwater and tidal wetlands in the area.[315] This commenter also called for evaluating impacts on saltmarshes and identifying protective measures, stating the significance of saltmarshes to New York State's marine district.

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[312] Clean Ocean Action.
[313] EPA.
[314] Clean Ocean Action.
[315] New York State.

O.4.28 Comments on Other Resource or Stressor Topics

Nine commenters provided comments on other resource or stressor topics.

Several commenters discussed various other issues related to resources or stressor topics. A couple of commenters mentioned using wind turbines to facilitate aquaculture or biodiversity. One commenter asked whether the government had considered establishing oyster beds or artificial reefs for wildlife at wind turbine bases.[316] Another commenter asked whether there were plans to employ aquaculture structures at the base of wind turbine foundations to "create habitats for mussels, oysters, sea weed and other sea life," suggesting that such structures could improve water quality and reduce reliance on sea food imports.[317] The commenter also asked how private companies could obtain permits to create, manage, and monetize such aquacultures. This commenter also asked how much energy would be generated for the NY Bight area and Monmouth County specifically and whether this proposal would eliminate fossil fuel use in the area. One commenter that BOEM adopt "net positive" biodiversity goals to guide the maintenance and enhancement of species and habitats impacted by offshore wind development.[318]

A couple of commenters mentioned security issues. One commenter recommended identifying emergency preparedness measures for severe storm events.[319] Another commenter expressed concern about offshore wind turbines' vulnerability to war time or terrorist attacks and stated that the issue should be addressed in the PEIS.[320]

One commenter stated that offshore wind energy is not emissions-free and argued that the "emissions from the activities necessary to prepare, build, operate, maintain, and decommission offshore wind energy facilities" should be included in the PEIS.[321] The commenter called for BOEM to address issues related to the amount of fossil fuel displacement that would occur due to offshore wind energy production. The commenter stated that it was unclear which State will receive the energy from the leases. The commenter additionally stated that the PEIS "must include all areas from where materials will be sourced for offshore wind project components in the environmental review," along with emissions data from turbine infrastructure production. The commenter called for the PEIS to evaluate secondary impacts related to onshore development needed to support the lease sales, management of dredged material, turbine malfunction, and security issues. This commenter expressed concern that wind energy development in the NY Bight requires the mining of rare earth elements with environmental consequences and suggested that the PEIS should consider these.

One commenter suggested requiring real-time cable monitoring technology for rapid identification of hazards, performing "micro siting" of wind energy infrastructure with fishermen familiar with the

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[316] Jeffrey Tyler.
[317] Twin Lights Historical Society.
[318] The Nature Conservancy.
[319] New York State.
[320] James Binder.
[321] Clean Ocean Action.

ecosystem, and coordinating transmission to minimize infrastructure in the water and seabed.[322] This commenter also suggested defining thresholds to determine when environmental impacts are unacceptable and establishing adaptive management procedures. Another commenter discussed the importance of night skies and recommended the following: requiring an Aircraft Detection Lighting System to turn aviation obstruction lights on and off in response to detection of aircraft, shielding and directing security lighting downward, keeping lights off when they are not needed, using the minimum necessary brightness, using warm color-temperature lights, and requiring lighting plans in project-specific EISs.[323]

One commenter submitted comments on several various resource topics.[324] The commenter requested that BOEM consider changes that they would like acknowledged in the Draft PEIS including the impact of automation on the potential for job creation; the reliability and storage capabilities of wind energy systems; advancements in other types of renewable energy technologies; and the cost of offshore wind alternatives, among other issues. The commenter stated that the cost of offshore wind power is high, even after subsidies, suggested that those who use electricity derived from wind energy will have to pay more than they would for natural gas, and questioned how power grid transmission needs would be financed. The commenter questioned whether there was a federal agency that would be performing an analysis, comparing the cost reliability of wind energy to other clean technology alternatives, and requested that BOEM identify and assess backup technologies needs and plans if offshore wind output is rendered insufficient due to storms or low wind. The commenter stated onshore alternatives to offshore wind were available that could meet clean energy needs and questioned why they were not being considered. The commenter mentioned as an alternative the upgrading of "natural gas power plants to include combined cycles power generation." The commenter requested that BOEM "present a numeric analysis of impacts on greenhouse gas emissions of the Proposed Action and compare those emissions reductions to the increases in global greenhouse gas emissions." The commenter requested an analysis of the benefits of onshore clean technology.

O.5 National Historic Preservation Act/Section 106 and Programmatic Agreement

Comments associated with the National Historic Preservation Act (NHPA)/Section 106 process are discussed in this section.

O.5.1 Programmatic Agreement

Four commenters provided comments on the NHPA Programmatic Agreement.

A commenter supported BOEM's intention to develop an NHPA Section 106 Programmatic Agreement (PA) and recommended including, as consulting parties, the New York and New Jersey State Historic

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[322] Responsible Offshore Development Alliance.
[323] National Park Service.
[324] James Binder.

Preservation Officers (SHPOs). The commenter also recommended including in the consulting parties from the Empire Wind development, the Advisory Council on Historic Preservation, and Native American Tribes. They cited 36 Code of Federal Regulations (CFR) 800.4(a)(2) as the engagement of the New York and New Jersey SHPOs as PA consulting parties.[325] Another commenter agreed that BOEM should coordinate with New York State's Office of Parks, Recreation and Historic Preservation (NYS OPRHP), which houses the State's SHPO.[326]

Another commenter recommended that BOEM develop a system to streamline Section 106 PAs for individual COPs by tiering them off the PA. The commenter added that impacts on historic resources will vary widely depending on the location of turbines and export cables, reasoning that, for instance, turbines located more than 23 miles from the shore may not be visible. The commenter recommended that BOEM develop consistent metrics to apply for NHPA determinations across the NY Bight COPs.[327]

The commenter also requested that BOEM provide more information as to when Section 106 consultations for the NY Bight will take place and conclude; they stated that geophysical surveys for windfarm development will need to take place soon and that the PA could impact the scale and scope of geophysical surveys to identify marine archaeological resources. Thus, the commenter wrote, information from BOEM as to when the PA will be available will help in the geophysical survey planning process.[328]

Another commenter stated that it accepted BOEM's invitation to become an NHPA Section 106 consulting party.[329]

O.5.2 Impacts on Historic Properties

Three commenters provided comments on impacts on historic properties.

A commenter cited Section 106 as requiring that federal agencies consider the impacts of their actions on historic properties. The commenter stated that, during recent virtual public meetings, consulting parties raised concerns about BOEM's process for identifying historic properties, addressing adverse impacts, and creating a framework to mitigate adverse impacts in a manner proportionate to their threat.[330] Another commenter generally requested that BOEM consider impacts on historic resources, including "submerged landforms."[331]

A commenter anticipated that the projects would have no impact on the visual character of onshore resources because the projects would be 42 and 54 miles offshore. The commenter further stated that BOEM has previously found wind turbines to cause adverse impacts on "historic maritime settings." The

[325] National Park Service.
[326] New York State.
[327] Attentive Energy LLC.
[328] Attentive Energy LLC.
[329] Invenergy Wind Offshore LLC.
[330] Cape May County, NJ; Point O'Woods Association, Fire Island, NY.
[331] New York State.

commenter requested that BOEM provide a definition of this term in the PA or other guidance. The commenter added that current conditions, such as vessel traffic, aircraft, modern structures, nighttime lighting, and other modern elements already compromise the “historic maritime settings” from the view of historic properties.[332]

O.5.3 Identification of Historic Properties Under NHPA

Three commenters provided comments on the identification of historic properties under NHPA.

A commenter provided several comments regarding the identification of historic properties under NHPA. The commenter provided an overview of National Historic Landmarks and the procedural safeguards afforded to the properties by NHPA Sections 106 and 110(f). The commenter stated that it has statutory responsibility for two National Parks and several National Historic Landmarks in the NY Bight and provided information in its comment to respond to BOEM’s request for feedback regarding the identification of historic properties in the area. It described the Carrington Estate, several structures at Fire Island National Seashore, and locations at the Gateway National Recreation Area as historic properties that could be impacted by NY Bight development. The commenter requested that these National Parks and National Historic Landmarks be included in BOEM maps illustrating the NY Bight, offering to assist in this request by providing location data.[333] Also providing information on nearby historic properties, another commenter wrote that, pursuant to responsibility delegated to it by the New Jersey State Legislature, it has designated a historic district in Beach Haven that could be impacted by NY Bight development.[334]

A commenter recommended that BOEM design a phased identification process for marine archaeological resources within the NY Bight. The commenter suggested using, per 36 CFR 800.4(b)(2), phased identification efforts in progressively narrower surveys rather than implementing 30-meter survey intervals at the outset. The commenter reasoned that using 30-meter survey intervals results in overly detailed surveys of areas that development, because of preferred alternative selection or project design, ultimately would not affect. The commenter stated that using survey intervals of this precision increases costs and impacts on marine life. Application of a 30-meter survey interval to identify smaller, buried marine cultural resources could be done within the project footprint, the commenter suggested, following the issuance of a Record of Decision.[335]

O.6 Consultations

Comments associated with the various consultations are discussed in this section.

[332] Attentive Energy LLC.
[333] National Park Service.
[334] Borough of Beach Haven.
[335] Attentive Energy LLC.

O.6.1 ESA

Three commenters provided comments on ESA consultations.

A commenter emphasized that the ESA and Essential Fish Habitat (EFH) consultations are complementary and should be treated as such. The commenter reasoned that ESA and EFH consultations rely on standard project design criteria to avoid, minimize, and monitor impacts on ESA-listed species, designated critical habitats, and EFH.[336] A commenter recommended that BOEM integrate a framework for the ESA and EFH compliance, arrived at through coordination with NMFS and USFWS, into the purpose and need, alternative analysis, and effects analysis portions of the PEIS.[337]

Another commenter recommended that BOEM implement a programmatic process to facilitate interagency coordination itself and NOAA/NMFS in their ESA consultations for specific COPs.[338]

O.6.2 EFH

A commenter emphasized that the ESA and EFH consultations are complementary and should be treated as such. The commenter reasoned that ESA and EFH consultations rely on standard project design criteria to avoid, minimize, and monitor impacts on ESA-listed species, designated critical habitats, and EFH.[339]

O.6.3 Other (e.g., Marine Mammal Protection Act, Coastal Zone Management Act)

Five commenters provided general comments on other consultations, such as the Marine Mammal Protection Act (MMPA) and Coastal Zone Management Act (CZMA).

O.6.3.1 MMPA and CZMA

A commenter recommended a programmatic process be used to facilitate interagency coordination between BOEM and NOAA/NMFS in their MMPA consultations for specific COPs.[340] A commenter wrote that it may issue an incidental take authorization under MMPA for wind project development but that such an authorization would likely require further NEPA documentation. The commenter stated that, properly developed, a PEIS could support the issuance of a letter of authorization covering all COPs.[341]

A commenter stated that it is important to align the timing of CZMA reviews with New York Department of State (NYSDOS) Coastal Management Programs.[342]

[336] National Marine Fisheries Services.
[337] Invenergy Wind Offshore LLC.
[338] American Clean Power Association.
[339] National Marine Fisheries Services.
[340] American Clean Power Association.
[341] National Marine Fisheries Services.
[342] New York State.

O.6.3.2 General Comments on Governmental Consultations

A few commenters generally recommended that BOEM coordinate with other federal agencies at the PEIS stage rather than only for specific projects.[343] One of the commenters reasoned that early coordination would help in cumulative analyses and in designing mitigation strategies, but also suggested that BOEM consider lessons learned in other OCS regions and avoid "artificial restrictions" that could prevent full utilization of the NY Bight.[344]

A commenter stated that BOEM should, under 43 United States Code 1337(p)(7), consider affected States' offshore wind procurement goals in evaluating NY Bight projects under NEPA and the Outer Continental Shelf Lands Act (OCSLA), reasoning that these goals are vital to the States' interest in the permitting process.[345] A commenter requested that BOEM continue to coordinate with New York through the PEIS and COPs processes, stating that New York State agencies will have statutory obligations to approve offshore wind transmission projects as well as transmission line siting. The commenter attached a document detailing the NYDOT's legal authorities relevant to NY Bight developments. Overall, the commenter recommended that BOEM coordinate with NYSDPS, NYSDOT, OPRHP, NYSDEC, and NYSDOS, with NYSDOS formally requesting to be a NEPA cooperating agency. The commenter also requested that BOEM confirm that the PEIS will not authorize development activities and that BOEM would not initiate federal consistency reviews at the PEIS stage.[346]

O.7 Comments on the Scoping Process

Three commenters provided comments on the scoping process.

A commenter recommended that BOEM use the scoping process to clarify a compensatory mitigation approach based on the best available science and designed to maximum ecological benefits, especially with respect to protecting biological diversity. The commenter recommended mitigation efforts such as acquiring critical coastal land or using management strategies to abate threats, and added that targeted properties for mitigation and monitoring may be outside the footprint of the projects themselves.[347]

Another commenter stated that the PEIS should consider impacts related to decommissioning, reasoning that such impacts are foreseeable and thus required under NEPA. Additionally, the commenter stated that decommissioning would be a major regional impact, and thus appropriate to analyze in the PEIS. The commenter added that decommissioning efforts can be expensive, describing one project in which decommissioning accounted for 20 percent of project costs.[348] Also addressing decommissioning, a commenter requested information on anticipated decommissioning of cable protection and scour protection areas. The commenter supported BOEM requiring the removal of

[343] The Nature Conservancy, Atlantic Shores Offshore Wind, LLC.
[344] Atlantic Shores Offshore Wind, LLC.
[345] American Clean Power Association.
[346] New York State.
[347] The Nature Conservancy.
[348] Save Long Beach Island, Inc.

generation and transmission infrastructure during decommissioning, as long as such efforts would be accompanied by monitoring and contamination control measures.[349]

O.8 Other Comments

This section discusses comments that generally fell into miscellaneous categories.

O.8.1 Comments on NEPA Cooperating Tribal Government and Cooperating or Participating Agencies

Approximately 10 commenters provided comments on NEPA Cooperating Tribal Government and cooperating or participating agencies consultations.

O.8.1.1 Tribal Consultations

A commenter recommended that, to the extent federally recognized Tribes are impacted by activities described in the PEIS, the PEIS include a description of the processes and outcomes of consultations with Tribal Nations.[350] Another commenter stated that "the Delaware Nation; the Delaware Tribe; Cayuga; Mohican; Shinnecock; and Stockbridge-Munsee Community, Wisconsin; and one State recognized Tribe, the Unkechaug" have interests in the south shore of Long Island, urging BOEM to consult with these Tribes throughout the NY Bight OCS process.[351] Another commenter recommended that BOEM take a lead role in organizing tribal outreach for the NY Bight for both Section 106 consultations and NEPA cooperation; the commenter reasoned that doing so would promote efficiency and, consistent with an August 1, 2022, BOEM letter, reduce stakeholder burdens.[352]

O.8.1.2 Interagency Coordination

A commenter recommended that BOEM coordinate with NOAA, the United States Army Corps of Engineers (USACE), and the Advisory Council on Historic Preservation to ensure that the agencies conduct programmatic analyses in parallel with the PEIS, agree on AMMM measures, and commit to similar timelines.[353] Another commenter agreed, stating that a standalone PEIS from BOEM, without interagency consultation, would be inefficient.[354]

A commenter stated that it would, in a separate letter, accept cooperating agency status under NEPA for the PEIS and consulting party status under NHPA.[355]

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[349] New York State.
[350] EPA.
[351] New York State.
[352] Invenergy Wind Offshore LLC.
[353] American Clean Power Association.
[354] Invenergy Wind Offshore LLC.
[355] National Park Service.

A commenter stated that, given the scope of the PEIS, BOEM should collaborate with "NMFS, state fishery agencies, fishery management councils and commissions, ocean data experts including the Regional Ocean Partnerships, United States Integrated Ocean Observing System (IOOS), [and the] NOAA National Centers for Coastal Ocean Science (NCCOS)," and should also consider fishing industry-held data and "fishermens' [sic] ecological knowledge."[356] Another commenter stated that the New Jersey Research and Monitoring Initiative (RMI) studies marine and coastal resources concerns related to New Jersey offshore wind development and has partnered with NYSERDA, the Regional Wildlife Science Collaborative, and the Responsible Offshore Science Alliance. The commenter supported BOEM coordinating research and monitoring efforts.[357] A commenter stated that input from other agencies is still needed, providing as an example a take request from NMFS for North American right whales.[358]

Another commenter agreed, reasoning that consulting agencies may have focuses other than energy development and thus that BOEM should insist on relevant statutory deadlines—in particular, the commenter emphasized the importance of close coordination between BOEM and NOAA, USACE, USFWS, and the Advisory Council on Historic Preservation to ensure an efficient review process.[359]

A commenter stated that, in previous offshore wind leasing projects, there has been insufficient coordination with local governments; the commenter raised the "Rhode Island SAMP [Special Area Management Plan] process" and Vineyard Wind as examples in which New York fisherman had too little representation.[360]

O.8.2 Comments on Potential Authorizations

No comments are associated with this issue.

O.8.3 Comments on the Timeline for the Notice of Availability of the Draft PEIS

Eight commenters provided comments on the timeline for the Notice of Availability (NOA) of the Draft PEIS.

Several commenters supported the programmatic approach, emphasizing its importance in expediting reviews and ultimately the authorization of COPs.[361] A couple of commenters also recommended that BOEM should take an active role to ensure that environmental reviews remain on schedule.[362] A commenter emphasized the importance of timeliness in environmental reviews for the NY Bight and recommended that BOEM impose a firm schedule for its consultations with NOAA, USACE, and other agencies.[363]

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[356] Responsible Offshore Development Alliance.
[357] NJDEP.
[358] J. Binder.
[359] Community Offshore Wind.
[360] Long Island Commercial Fishing Association.
[361] Invenergy Wind Offshore LLC, Community Offshore Wind.
[362] Community Offshore Wind, OW Ocean Winds East, LLC.
[363] Atlantic Shores Offshore Wind, LLC.

To facilitate the PEIS's role in expediting the NY Bight environmental reviews, a commenter recommended that drafts for specific COPs be initiated before the finalization of the PEIS; the commenter reasoned that doing so would provide flexibility for different tiering approaches and ensure the PEIS does not inhibit project-specific reviews.[364] Another commenter also emphasized that the PEIS process should be concluded within 2 years. As part of that process, the commenter stated that the representative project design envelope (RPDE) should be defined and the AMMM measures selected in a manner consistent with leaseholder needs; in particular, the commenter stated that AMMM measures should include reasonably foreseeable options. The commenter stated that, to facilitate timeliness, the scope of the PEIS should include all issues common across the NY Bight.[365]

Conversely, another commenter questioned the role of a PEIS in expediting the leasing process, stating that, in the August 2 meeting, BOEM statements on PEIS efficiency failed to recognize the capacity for developers to quickly collect field data and prepare for COPs. The commenter also stated that New York and New Jersey appear prepared to move forward with leasing, stating that "NYSERDA has teed up RFP3S, (2,000 MW minimum) while NJ BPU has teed up RFP 3 for Q1, 2023 (1,200 MW minimum)." The commenter questioned if developers, New York, and New Jersey agreed with the PEIS approach. In considering impacts on timeliness, the commenter stated that BOEM should consider the impact of delays on carbon dioxide emissions.[366] Another commenter expressed concern that the PEIS could impose delays because the process for offshore wind development is untested.[367]

Another commenter expressed concern for an expedited NY Bight PEIS timetable. The commenter stated that ongoing litigation involving wind turbines could impact developer permitting goals.[368] Another commenter stated that the "Fast 41" initiative, and the fast-tracking of development, serves private developers' interests at the expense of BOEM's duty to hold offshore resources in the public trust. The commenter expressed concern for the impacts of NY Bight development to marine life and stated that 60 days for review should be provided for the environmental review documents relevant to the project.[369]

O.8.4 Comments on Public Comment Process/Engagement

Approximately 10 commenters provided comments on the public comment process or engagement.

O.8.4.1 Public Outreach

A commenter recommended that BOEM develop a Community Outreach Plan to include in NEPA documentation and ensure that documentation is available to linguistically isolated communities.[370] Another commenter generally agreed that the BOEM should make efforts towards public participation

[364] Attentive Energy LLC.
[365] Community Offshore Wind.
[366] T. Barten.
[367] OW Ocean Winds East, LLC.
[368] Cape May County, NJ; Point O'Woods Association, Fire Island, NY.
[369] Clean Ocean Action.
[370] EPA.

and consultation with local communities.[371] A commenter stated that BOEM should continue to engage with the public and stakeholders in the scoping process for NY Bight environmental reviews.[372]

A commenter provided a citation in recommending that BOEM convene a roundtable with DAC stakeholders as part of PEIS development. The commenter recommended identifying DACs by coordinating with the Intergovernmental Renewable Energy Task Force and by using a Climate and Economic Justice Screening Tool. The commenter attached a sample agenda for such a roundtable. The commenter also recommended that BOEM post documentation and notes relevant to DAC outreach and engagement to the BOEM website, similar to BOEM practices for the Intergovernmental Renewable Energy Task Force.[373] Another commenter stated that BOEM should consider implementing an adaptive management plan to address the possibility of environmental impacts that become more significant than initially anticipated. The commenter stated that this plan may include roles for non-fishing stakeholders or community liaisons. In addition, the commenter recommended that BOEM develop a mariner communication plan.[374]

A commenter stated that some of the benefits of the PEIS approach could be realized by coordinating with developers, citing the 1- by 1-nautical mile east–west/north–south grid agreed upon by developers in the Massachusetts WEA.

O.8.4.2 Public Comment Process

A commenter suggested that 45-day comment periods be provided for NY Bight environmental reviews and added that commenters should, because of the tiering approach to reviews, have the right to revisit and comment further on COP-specific NEPA analyses beyond this period.[375] Another commenter requested that all future environmental review documents, including environmental assessments, be available in draft form for public comment.[376]

A commenter expressed concern that the NY Bight environmental review processes have not been concluded before leases are awarded to developers. The commenter stated that the public comment period for the NY Bight has been too short and that public hearings should be held. Furthermore, the commenter stated that BOEM has privileged the importance of New York's interests, rather than those of New Jersey, in the NY Bight project.[377] Another commenter stated that BOEM has recently entered into several "fast-tracked" memoranda of understanding and PAs relevant to offshore wind; the commenter stated that BOEM should clarify how these fast-tracked documents are being implemented for NY Bight lease developments and environmental reviews.[378]

[371] New York State.
[372] Invenergy Wind Offshore LLC.
[373] Aspen Institute.
[374] New York State.
[375] US Coast Guard.
[376] New England and Mid-Atlantic Fishery Management Councils.
[377] Borough of Seaside Park.
[378] Clean Ocean Action.

A commenter recommended that lessees in contiguous areas consolidate their public outreach processes for the fishing industry, reasoning that, for instance, there are similar interests for scallop fishers across all six lease areas.[379]

O.8.4.3 Transparency and Information Availability

A commenter stated that good governance requires public trust in project development and transparency.[380] Additionally, the commenter stated that research on wind farm impacts is disparate and that creating a centralized portal for this research would be useful. The commenter emphasized the importance of the PEIS using the best available science and dynamic modeling based on multiple scenarios. The commenter stated that, in evaluating research, BOEM should consider whether research comes from disinterested parties or researchers with conflicting financial motivations.[381] Another commenter also recommended that BOEM support a centralized data portal for information on the environmental impacts of offshore wind development.[382]

O.8.5 Request to Extend Public Comment Period

Two commenters provided comments about extending the public comment period.

A commenter recommended that the comment period for the programmatic DEIS "be extended by a minimum of 3 months" from the 45-day norm, and that BOEM issue a supplemental EIS if more information or inputs become available later.[383]

A commenter recommended that the comment period for the PEIS scoping be extended.[384] Another commenter stated that the public comment period for NY Bight development was too short.[385]

O.8.6 Comments on the Programmatic Approach

Approximately 10 commenters provided comments on the programmatic approach.

O.8.6.1 Support for the Programmatic Approach

A commenter supported the use of a PEIS in the NY Bight as the best way to assess impacts and examine alternatives. The commenter also stated that the PEIS standpoint will allow BOEM to examine potential export cable connection points and identify AMMM measures. However, the commenter questioned how the proposed framework would parse negligible, minor, moderate, and major impacts. The commenter recommended that the PEIS compare alternative, full build-outs for the NY Bight—rather than a representative project—and consider requiring a suite of AMMM measures as conditions of COP

[379] Fisheries Survival Fund.
[380] Clean Ocean Action.
[381] Clean Ocean Action.
[382] R. Griffin.
[383] J. Binder.
[384] J. Binder.
[385] Borough of Seaside Park.

approval. The commenter recommended that BOEM utilize representative projects for each lease as appropriate for a basic review of protected species, habitat, fisheries overlaps, and navigational conflicts for a full build-out analysis.[386] Another commenter also expressed support for the programmatic approach, anticipating that the PEIS would include planning for offshore wind infrastructure to minimize impacts on natural resources. The commenter also emphasized the importance of, within the PEIS, standardizing data collection for research and monitoring of impacts on wildlife and fisheries.[387] Another commenter urged BOEM to coordinate planning with the Department of Energy while also facilitating preconstruction surveys.[388] A commenter supported the PEIS as a way to discuss cumulative impacts and facilitate captains', anglers', and other stakeholders' input.[389]

Another commenter stated that the programmatic approach could improve the efficiency of the permitting process while programmatic AMMM measures could make impacts more predictable.[390] A commenter stated that PEIS can help mitigate environmental impacts by improving project citing. The commenter supported using a PEIS overall but stated that specific COPs should be assessed by a full EIS rather than an environmental assessment.[391]

O.8.6.2 Criticism of the Programmatic Approach

Conversely, a commenter opposed the PEIS approach as "bifurcating" reviews and threatening historic properties. The commenter stated that a better approach would "take into account all the interrelated historical, cultural, scientific and economic impacts and threats" associated with NY Bight wind power development. The commenter added that there have been insufficient pilot projects and scientific review to support NY Bight development. The commenter also stated that BOEM failed to follow its own regulations by issuing a proposed sale notice before an environmental review. The commenter stated that BOEM's process violates NEPA by providing too little scientific basis for a proposed action.[392] Another commenter stated that impacts, such as impacts on fisheries, should be evaluated on a project-specific level.[393]

Another commenter questioned whether a PEIS is appropriate, stating that a prior EIS for an offshore windfarm minimized impacts on sea turtles as "minor."[394] Also discussing minor impacts, another commenter hoped that BOEM will be able to identify minor environmental impacts, such as EMFs around transmission cables, at the PEIS stage.[395]

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[386] National Marine Fisheries Services.
[387] NJDEP.
[388] New York State.
[389] American Saltwater Guides Association.
[390] The Nature Conservancy.
[391] National Wildlife Federation et al.
[392] Borough of Seaside Park.
[393] Fisheries Survival Fund.
[394] Clean Ocean Action.
[395] American Clean Power Association.

O.8.6.3 Other Comments on the Programmatic Approach

A commenter stated that BOEM should disclose all important information relevant to the PEIS and state when information is unavailable or incomplete, providing a citation. The commenter emphasized the importance of accurate, up-to-date information to inform its environmental reviews and its characterization of impacts as minor or major. The commenter recommended that, in situations where the predictive certainty of possible impacts is low, BOEM require monitoring and provide adaptive management recommendations.[396] Another commenter stated that the PEIS should be based on sound science according to "standards for which scientific validation will be used." The commenter said the PEIS should provide a framework for incorporating new science and "benchmarks" that BOEM would use to assess the project's impacts.[397]

A commenter recommended that BOEM describe standardized processes and metrics to evaluate deviations from the PEIS.[398] Another commenter requested that the Draft PEIS include an explanation of changes since BOEM efforts to develop a PEIS in 2007. The commenter also requested that the PEIS include a quantified cost-benefit analysis that includes impacts on electric ratepayers.[399]

A commenter stated that the PEIS for the NY Bight should not be applied to other regions as the PEIS will be based on region-specific data.[400]

A commenter stated that they recognize the benefits inherent in a programmatic approach to assessing the common impacts of offshore wind development and measures to mitigate those impacts. However, the commenter appreciated that BOEM has been clear that individual projects may submit a COP in a timeline that best suits their needs.[401]

O.8.7 Comments on the RPDE (Including Cable Routes, Landfalls, etc.)

Approximately 17 commenters provided comments on the RPDE.

O.8.7.1 Need for Flexibility in RPDE Analysis or Design Parameters

A commenter expressed concern with respect to the RPDE, stating that developers are likely to change the scope of their COPs after the PEIS is finalized and that it could be difficult to adjust environmental reviews to these changes while adhering to project timelines. The commenter provided an example of this from the Vineyard Wind offshore wind project.[402]

A commenter urged BOEM to examine a variety of representative models using different technologies, and, in particular, models using "quiet technology fixed-foundations" and floating wind technology. The

[396] National Wildlife Federation et al.
[397] Clean Ocean Action.
[398] New York State.
[399] J. Binder.
[400] American Clean Power Association.
[401] Attentive Energy LLC.
[402] Seafreeze Shoreside, Seafreeze Ltd.

commenter recommended that BOEM's analysis consider impacts on waves based on differing foundations, providing citations. The commenter stated that quiet technologies may cause less harm to marine mammals and thus expedite MMPA reviews.[403] Another commenter agreed that the RPDE should evaluate several representative projects and consider technologies to avoid and minimize environmental impacts. The commenter provided a list of its own priorities in RPDE design, including evaluating gravity-based and suction bucket alternatives, using vibro pile versus impact piling, and factors relevant to scour protection and timing of activities.[404] Another commenter also provided numerous recommendations for project planning, siting, and design to minimize environmental impacts.[405]

Other commenters stated that, because the PEIS process may take years and offshore wind technology is advancing, the RPDE should not prescribe the use of certain technologies[406] or should anticipate the development of technological advances.[407] A few commenters said that BOEM should design its RPDE around a set of principles and outcomes rather than means of achieving those outcomes.[408] One of the commenters said that, in addition to technology, the RPDE should not specify project layout or siting within the lease area.[409] Another commenter said that, under a "maximum-case scenario," specifying project parameters such as foundation type does not assist project design. The commenter recommended that project parameters should instead focus on environmental impacts.[410] A commenter provided citations to recent redesigns in the Vineyard Wind project, arguing that these indicate that even an RPDE designed to accommodate changing wind turbine technologies may be unable to anticipate changing developer preferences over 2 years.[411] A couple of other commenters stated that BOEM should consult with turbine manufacturers and other equipment providers to develop the RPDE.[412] One of the commenters stated that, once BOEM has done so and produced an RPDE, it should present the RPDE to leaseholders for comment.[413] A comment stated that it is difficult for developers to provide locations for landing sites and onshore facilities at the PEIS stage because these decisions rely on State permitting. The commenter recommended that BOEM assess categories of landing sites and onshore facilities, arguing that such an approach is appropriate under OCSLA and would allow evaluation of various impact-producing factors.[414]

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403 National Wildlife Federation et al.
404 The Nature Conservancy.
405 National Marine Fisheries Services.
406 Vineyard Offshore LLC, American Clean Power Association, Atlantic Shores Offshore Wind, LLC, New York Offshore Wind Alliance.
407 New England and Mid-Atlantic Fishery Management Councils, Community Offshore Wind.
408 American Clean Power Association, New York Offshore Wind Alliance.
409 Atlantic Shores Offshore Wind, LLC.
410 Invenergy Wind Offshore LLC.
411 Seafreeze Shoreside, Seafreeze Ltd.
412 Community Offshore Wind, OW Ocean Winds East, LLC.
413 OW Ocean Winds East, LLC.
414 Attentive Energy LLC.

A commenter said that BOEM should base its RPDE on public information for similar projects and should consult with DOE on the reasonably foreseeable limits of technical and economic feasibility.[415] Another commenter agreed that BOEM should rely on information from other projects to characterize "minor" impacts or to inform analysis.[416] With respect to economic feasibility, a commenter also recommended that BOEM consider supply chain issues and tax credit availability under the Inflation Reduction Act in its RPDE.[417]

O.8.7.2 Power Transmission

Several commenters addressed wind power transmission. One urged BOEM to consider a backbone transmission effort and comparative cable corridor development impacts as part of the PEIS.[418] A commenter stated that BOEM should consider Wind Turbine Generator (WTG) layout and spacing to accommodate fishing and transit needs. The commenter stated that the layout should maximize efficiency for cable layouts to serve neighboring projects—such as Ocean Wind and Atlantic Shores—and minimize turbulent flow and wake effects.[419] Another commenter agreed that BOEM should consider backbone transmission designs and coordinating power transmission among multiple projects.[420]

Another commenter stated that BOEM should require the use of jet plows to bury inter-array cables, providing citations and stating that this method causes the fewest adverse environmental impacts. The commenter added that BOEM should consider implementing seasonal restrictions on cable burial to protect wildlife. Additionally, the commenter stated that BOEM should take into account how cable burial increases turbidity and how developers can minimize these impacts. Finally, the commenter asserted that open loop cooling systems for direct current transmission would not be appropriate in the NY Bight, citing the impacts of such systems from another EIS.[421]

Another commenter recommended that BOEM, as ways to minimize mobilization of the seabed from burying cables, consider requiring that developers:

- Include a robust siting analysis to avoid dynamic areas with known high seabed mobility.
- Include mariner notifications of shallow-buried and exposed cables and cable protection measures.
- Include methods to monitor and maintain target burial depth for the maximum possible distance and expeditiously repair/rebury cable(s).
- Evaluate adaptive management if repeated cable exposures occur.

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415 Invenergy Wind Offshore LLC.
416 T. Barten.
417 American Clean Power Association.
418 National Wildlife Federation et al.
419 EPA.
420 New England and Mid-Atlantic Fishery Management Councils.
421 National Wildlife Federation et al.

With respect to submarine cable system burial and risk assessment, the commenter recommended that BOEM:

- Include draft assessment in the COP and BOEM's COP-specific NEPA analysis.
- Evaluate existing and emerging cable installation techniques to achieve target burial depth for the maximum possible distance.
- Evaluate secondary cable protection measures and include how impacts have been avoided and minimized to the greatest extent possible.[422]

Another commenter recommended that, with respect to power transmission RPDE concerns, BOEM consider:

- Potential incorporation of meshed or shared offshore transmission.
- Closed vs open-loop cooling of offshore AC/DC conversion stations.
- Operational noise profiles among alternative turbine options.
- Cable route options (particularly focusing on conflict avoidance and improved energy delivery opportunities).[423]

Another commenter recommended that BOEM require submission of as-built surveys to identify cable protection areas and extant cables in a project area.[424]

O.8.8 Comments on the Proposed Tiered Review Process

Six commenters provided comments on the proposed tiered review process.

A commenter supported a tiered review process for NY Bight development and expressed optimism that leaseholders, regulators, and stakeholders can collaborate for an efficient environmental review process.[425] A commenter also supported the approach and recommended that BOEM provide sufficient detail in the PEIS to "support impact assessment at a landscape level" and prevent the duplication of analyses at the COP level.[426] Another commenter supported the tiered approach, stating that the approach should avoid the repeated discussion of similar issues for multiple projects. The commenter added that the tiered approach should facilitate the adoption of programmatic AMMM measures where appropriate while preserving flexibility for AMMM measures to address site-specific needs.[427]

[422] New York State.
[423] The Nature Conservancy.
[424] New York State.
[425] Vineyard Offshore LLC.
[426] Atlantic Shores Offshore Wind, LLC.
[427] New York Offshore Wind Alliance.

A commenter expressed concern that, if the PEIS is implemented, there will not be enough time to conduct thorough environmental analyses for specific COPs.[428]

A commenter wrote that adopting a tiered approach for windfarm development artificially bifurcates environmental review and prevents effective analysis of cumulative impacts. [429] Several commenters stated that more detail as to the tiered review process is needed.[430] The commenters asked, in particular, how "minor" environmental impacts will be handled at the project-specific tier of review.[431] Another stated that pre-approving AMMM measures has not previously been done in BOEM offshore wind leasing.[432]

O.8.9 Other Comments

Eight commenters provided other general comments on the PEIS, including comments specific to a lease area.

A commenter asserted that areas already leased at auction should be considered for the PEIS, not only those within NY Bight.[433] Another commenter added that the New Jersey lease area should be included in the scope of the PEIS.[434]

A commenter stated that BOEM should consider how recent commitments from New York and New Jersey to wind energy development demonstrate support for a local supply chain and how stakeholder engagement requirements affect the development of AMMM measures.[435]

A commenter wrote in support of green construction methods, including recycling materials and using energy-efficient technologies.[436]

A commenter stated that offshore wind development will be vital to meeting clean energy goals in the Northeast and mid-Atlantic, stating that it is currently impracticable to transmit energy from the "wind-belt" states.[437]

A commenter stated that it has performed research relevant to NY Bight development, providing citations. The commenter wrote that BOEM should reach out to its studies' authors to integrate their findings into BOEM's analyses.[438]

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[428] Seafreeze Shoreside, Seafreeze Ltd.
[429] Clean Ocean Action.
[430] Clean Ocean Action, Seafreeze Shoreside, Seafreeze Ltd.
[431] Clean Ocean Action, Seafreeze Shoreside, Seafreeze Ltd.
[432] Seafreeze Shoreside, Seafreeze Ltd.
[433] Long Island Commercial Fishing Association.
[434] Save Long Beach Island, Inc.
[435] Invenergy Wind Offshore LLC.
[436] EPA.
[437] T. Barten.
[438] Responsible Offshore Development Alliance.

A commenter listed lease blocks that fall into buffer zones identified by the Mid-Atlantic Marine Portal and cited a visual depiction to that end.[439]

A commenter asserted that, because leaseholders will develop COPs in parallel with the PEIS process, BOEM must coordinate with leaseholders up to the September 2023 Draft EIS to minimize delays.[440]

O.9 Out of Scope

A commenter provided comments on BOEM's "Process for Identifying Alternatives for Environmental Reviews of Offshore Wind COPs pursuant to the National Environmental Policy Act (NEPA)," stating that this document was never open for public comment and inaccurately reflects BOEM processes.[441]

[439] World Shipping Council.
[440] OW Ocean Winds East, LLC.
[441] Seafreeze Shoreside, Seafreeze Ltd.

Appendix P: Responses to Comments on the Draft Programmatic Environmental Impact Statement

Contents

List of Tables

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AC	alternating current
ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
AIS	Automatic Identification System
AMAPPS	Atlantic Marine Assessment Program for Protected Species
AMMM	avoidance, minimization, mitigation, and monitoring
APEs	areas of potential effects
ASMFC	Atlantic States Marine Fisheries Commission
BA	Biological Assessment
BIA	Biologically Important Areas
BMP	best management practice
BOEM	U.S. Department of the Interior Bureau of Ocean Energy Management
BSEE	U.S. Department of the Interior Bureau of Safety and Environmental Enforcement
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	carbon dioxide
COP	Construction and Operations Plan
CPAPARS	Consolidated Port Approaches Port Access Route Studies
CVOW	Coastal Virginia Offshore Wind
CWA	Clean Water Act
dB	Decibel
DC	direct current
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DP	dynamic positioning
EA	Environmental Assessment
EFH	essential fish habitat
EMF	Electric and magnetic field
ESA	Endangered Species Act
ESPIS	Environmental Studies Program Information System
FAA	U.S. Department of Transportation Federal Aviation Administration
FMP	Fishery Management Plan
G&G	geophysical and geotechnical
GHG	greenhouse gas
HAPCs	Habitat Areas of Particular Concern
HDD	Horizontal directional drilling
HMS	Highly Migratory Species
HRG	high-resolution geophysical
html	Hypertext Markup Language
HVAC	high voltage alternating current
HVDC	high voltage direct current
IMO	International Maritime Organization
IPF	impact producing factor

Acronym/Abbreviation	Definition
Jones Act	Merchant Marine Act of 1920
KOP	Key Observation Point
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MPRSA	Marine Protection, Research and Sanctuaries Act
MW/km^2	megawatts per square kilometer
NAAQS	National Ambient Air Quality Standards
NABat	North American Bat Monitoring Program
NARW	North Atlantic right whale
NAS	noise attenuation system
NEFMC	New England Fishery Management Council
NEPA	National Environmental Policy Act
NHCC	Naval History and Heritage Command
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NJDEP	New Jersey Department of Environmental Protection
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
NOAA	U.S. Department of Commerce National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. Department of Interior National Park Service
NRHP	National Register of Historic Places
NSRA	Navigation Safety Risk Assessment
NVIC	Navigation and Vessel Inspection Circular
NY Bight	New York Bight
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
O&M	operations and maintenance
O_3	ozone
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
ORECs	offshore renewable energy credits
OSS	offshore substation
PAM	passive acoustic monitoring
PDE	Project Design Envelope
PDF	portable document format
PEIS	Programmatic Environmental Impact Statement
$PM_{2.5}$	particulate matter with diameter of 2.5 microns and smaller
POI	point of interconnection
PSOs	protected species observers
PTS	Permanent Threshold Shift
ROD	Record of Decision
ROSA	Responsible Offshore Science Alliance
ROW	right-of-way

Acronym/Abbreviation	Definition
RP	recommended practice
RPDE	Representative Project Design Envelope
RSZ	rotor-swept zone
RWSC	Regional Wildlife Science Collaborative
SAP	Site Assessment Plan
SAR	search and rescue
SCRAM	Stochastic Collision Risk Assessment for Movement
SHPOs	State Historic Preservation Officers
T&Cs	Terms and Conditions
TCPs	traditional cultural properties
THPOs	Tribal Historic Preservation Officers
UME	Unusual Mortality Event
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WEA	Wind Energy Area
WTG	wind turbine generator

P.1 Introduction

On January 12, 2024, the U.S. Department of the Interior (DOI) Bureau of Ocean Energy Management (BOEM) published a Notice of Availability (NOA) for the New York Bight (NY Bight) Draft Programmatic Environmental Impact Statement (PEIS), consistent with the regulations implementing the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 et seq.), to assess the potential impacts of the Proposed Action and alternatives. The Draft PEIS was made available in electronic form for public viewing at https://www.boem.gov/renewable-energy/state-activities/new-york-bight, and hard copies or electronic copies were delivered to other entities as specified in Appendix N, *Distribution List*, of the Draft PEIS. The NEPA review process requires agencies to allow the public the opportunity to comment on a Draft PEIS. The NOA initiated a 45-day public comment period for the Draft PEIS. BOEM extended the comment period in response to requests from Tribal Nations and stakeholders. The extended comment period closed on March 13, 2024. This appendix describes the Draft PEIS public comment processing methodology and definitions, includes responses to comments received on the Draft PEIS, and describes where specific updates to the Final PEIS can be found in the document.

P.2 Objective

BOEM reviewed and considered all written and oral public submissions received during the Draft PEIS public review and comment period. BOEM's goal was to identify comments to be addressed in this Final PEIS and to categorize those comments based on the applicable resource areas or NEPA topics. This categorization scheme allowed subject matter experts to review comments directly related to their areas of expertise and allowed BOEM to generate statistics based on the resource areas or NEPA topics addressed in each of the comments. All public comment submissions received can be viewed online at http://www.regulations.gov by typing "BOEM-2024-0001" in the search field.

P.3 Methodology

P.3.1 Terminology

The following terminology is used throughout this appendix:

- Submission: The entire content submitted by a single person or group at a single time. For example, a 10-page letter from a citizen, an email with a portable document format (PDF) attachment, and a transcript of an oral comment given at a public hearing meeting were each considered to be a submission.
- Comment: A specific statement within a submission that expresses a sender's specific point of view, concern, question, or suggestion. A comment can consist of more than one sentence, as long as those grouped sentences express a single idea. One submission may contain many comments.

- Substantive Comment: Draft PEIS submissions were reviewed to identify and categorize "substantive" comments. To be substantive, a comment must relate to the reasonably foreseeable impacts of the Proposed Action, alternatives, or cumulative actions and do one or more of the following:
  - Question (with supporting rationale) the accuracy of information in the Draft PEIS.
  - Question (with supporting rationale) the adequacy of, methodology for, or assumptions used for the environmental analysis.
  - Present new information relevant to the analysis.
  - Present reasonable alternatives or mitigation measures other than those analyzed in the Draft PEIS.
  - Present or cause modifications to alternatives or mitigation measures analyzed in the Draft PEIS.
  - Correct factual errors in the content of the Draft PEIS.
- General Comment: General comments are comments other than substantive comments. General comments may: (1) express interest or concern regarding an impact topic without providing specific comments on the information, methods, or findings presented in the Draft PEIS; (2) express general support for or opposition to the Proposed Action or alternatives; or (3) comment on a topic unrelated to the Proposed Action or alternatives.

P.3.2 Comment Submittals

Tribal governments, federal agencies, state/local governments, and the general public had the opportunity to provide comments on the Draft PEIS via the following mechanisms:

- Electronic submissions via www.regulations.gov on docket number BOEM-2024-0001;
- Hard-copy comment letters submitted to BOEM via traditional mail; and
- Written or oral comments submitted at each of the public meetings.

BOEM held three in-person and two virtual public meetings via Zoom to solicit written and verbal comments to inform preparation of the Final PEIS. The meetings were free and open to the public. Locations and dates of these meetings are outlined in Table P.3-1.

Table P.3-1. Public Meetings

Date	Time	Location
January 31, 2024	5:00 p.m. Eastern Time	Zoom Webinar: https://kearnswest.zoom.us/webinar/register/WN_81Ha7GyxSXG-aNgk9EBajA
February 5, 2024	4:00 p.m. Eastern Time	UMass Dartmouth, The Marketplace, MacLean Campus Center, 285 Old Westport Rd, North Dartmouth, MA 02747
February 7, 2024	4:00 p.m. Eastern Time	Stony Brook University, Bauman Center for Leadership and Service, Benedict D013 Room C029, 200 Circle Rd, Stony Brook, NY 11790
February 8, 2024	4:00 p.m. Eastern Time	Clarion Hotel, 815 Route 37 West, Toms River, NJ 08755
February 13, 2024	1:00 p.m. Eastern Time	Zoom Webinar: https://kearnswest.zoom.us/webinar/register/WN__Bci_zhgRACj26jYkqrGlA

All submissions initially provided by methods other than www.regulations.gov, including the transcripts of comments recorded at each public meeting listed in Table P.3-1, were uploaded to the docket. Each submission, including testimony by individual speakers at the public meetings listed in Table P.3-1, was assigned a unique identification number. That unique Submission ID was retained throughout the comment management process, for both submissions and the individual comments within those submissions.

P.3.3 Comment Processing

BOEM downloaded and reviewed all submissions from regulations.gov. These submissions were provided in Hypertext Markup Language (html) format, while attachments provided by stakeholders as part of their regulations.gov submission were typically provided in PDF or Microsoft Word format. Text from all formats was parsed, coded, and exported into a single Microsoft Excel file that served as the primary submission database. In cases where an attachment did not contain comments specific to the docket for the NY Bight Draft PEIS, the attachment was retained separately for BOEM reference as applicable, linked to the main body of the submission through the unique Submission ID. Examples of this type of attachment include copies of comment letters that were originally submitted during the scoping period, copies of comment letters that were originally submitted on another docket, or attached photos, published reports, news articles, or other secondary material. The submission database also included information about each submission, including the submitter's contact information, submission date, and whether the submitter was a government entity or agency.

Each submission and all oral testimony were read to identify individual substantive and general comments (as defined under Section P.3.1, *Terminology*). Each comment was parsed, coded, and exported to a spreadsheet that served as the master comment database. Each comment then received a unique comment ID number, tied to the Submission ID. For example, the third comment identified in regulations.gov submission 0007 was identified as BOEM-2024-0001-0007-0003.

Substantive comments from cooperating agencies were organized by agency and are presented verbatim in Section P.4, *Responses to Cooperating and Participating Agency Comments on the Draft PEIS*. Other agency, stakeholder, and public comments were each assigned to one section of the Draft PEIS, based on the document's table of contents, or to a general topic such as "NEPA/Public Involvement Process." Substantive comments are presented verbatim in Section P.5, *Responses to Other Agency, Stakeholder, and Public Comments on the Draft PEIS*. General comments are summarized in Section P.6, *General Comment Summaries and Responses*, and the specific submissions that contributed to a comment summary are identified by submission number. Tables P.4-1 through P.8-1 include 1,507 of the 1,568 total comments submitted during the Draft PEIS comment period.[1]

[1] Additional comments from one cooperating agency and two tribes were submitted to BOEM internally and are not reflected in Appendix P per their request. However, their comments have been addressed in the Final PEIS, as appropriate.

P.4 Responses to Cooperating and Participating Agency Comments on the Draft PEIS

P.4.1 Cooperating and Participating Federal Agencies

P.4.1.1 National Park Service

Table P.4-1. Responses to Comments from the National Park Service (BOEM-2024-0001-0471)

Comment No.	Comment	Response
BOEM-2024-0001-0471-0001	Agency: NPS Commenter: NPS Section Title: Purpose of and Need for the Proposed Action Section #: 1.3 Page # 1-4 NPS is among the cooperating agencies participating in the PDEIS development process; would NPS continue to be engaged by BOEM on COP-specific NEPA reviews? NPS, as a bureau within DOI and cooperating Federal agency for the preparation of this EIS, has special expertise regarding the regulation of uses on NPS units and management of park system resources that includes compliance with the Park System Resource Protection Act (Public Law 113287, December 2014). NPS intends to support the decision to authorize mitigation and monitoring activities that are associated with park resources and their enjoyment on NPS lands and waters. Mitigation and monitoring activities on NPS lands and waters would include, but not be limited to, mitigation of impacts on National Historic properties, response activities should marine mammal strandings and/or disposals (burials) on NPS lands and waters increase, dark night skies, visitor experience, and economic impacts on lesees and other park partners operating within the park as a result of implementing the proposed plan.	BOEM will continue to engage with the U.S. Department of Interior National Park Service (NPS) for project-specific Construction and Operations Plan (COP) NEPA reviews.
BOEM-2024-0001-0471-0002	Agency: NPS Commenter: NPS Section Title: Purpose of and Need for the Proposed Action Section #: 1.3 Page #: 1-4 The Final Guidance for Effective Use of Programmatic NEPA Reviews (https://ceq.doe.gov/docs/ceq-regulations-and-guidance/Effective_Use_of_Programmatic_NEPA_Reviews_Final_Dec2014_searchable.pdf) for makes it clear that the Federal agency	Comment noted. BOEM appropriately describes, in Chapter 1, *Introduction,* why BOEM is preparing a programmatic analysis of the six NY Bight lease areas and the objectives for the programmatic review.

Comment No.	Comment	Response
	program responsible for complying with NEPA has the discretion to determine whether a programmatic NEPA review is appropriate (79 FR 76986). Discussion of why a PDEIS was identified by BOEM is appropriate, but it is not a distinguishing characteristic among the alternatives presented.	
BOEM-2024-0001-0471-0003	Agency: NPS Commenter: NPS Section Title: Purpose of and Need for the Proposed Action Section #: 1.3 Page #: 1-6 Line #: 5 Section 108 of the Fiscal Responsibility Act of 2023 (42 USC 4336b) provides time limits for PCEs, as allowing the programmatic environmental review document as being able to be relied on for 5 years as long unless there are substantial new circumstances or information about the significance of adverse effects that bear on the analysis. The question then becomes: How would post-construction monitoring be evaluated in a timely manner to verify that it either supports continued use of the PDEIS evaluation or provides the foundation for re-evaluating the underlying assumptions of the original analysis?	Prior to initiating NEPA review for each COP in the NY Bight, BOEM will review the COP and the PEIS to determine if the proposed project is within the general parameters of analysis included in the PEIS. BOEM will also evaluate whether the information analyzed in the PEIS is sufficient, considering factors such as age of data and availability of site-specific information, to incorporate by reference the analysis from the PEIS. If necessary, BOEM will engage in further analysis at the COP NEPA stage.
BOEM-2024-0001-0471-0004	Agency: NPS Commenter: NPS Section Title: Relevant Existing NEPA and Consulting Documents Section #: 1.5 Page #: 1-7 If the decision to lease for exclusive right to submit COPs for WTG construction has already been made, then including any characterization of the existing conditions (i.e., no WTGs) would have already been described in the associated NEPA analysis for the selected action. Since that analysis was completed and alternative selected, have there been substantive changes in the baseline condition that need to be captured in the PDEIS?	The PEIS used the most relevant and current information available regarding baseline conditions, and any information in the existing NEPA and consultation documents that were incorporated by reference was used, as appropriate.
BOEM-2024-0001-0471-0005	Agency: NPS Commenter: NPS Section Title: Alternatives Analyzed in Detail Section #: 2.1 Page #: 2-1 The decision to lease for exclusive right to submit COPs for WTG construction has already been made and the lease stipulations dictate options for consolidating equipment alignment and other features of any WTG (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/ATLW-8-NY-Bight-Final-Lease-Sale-Decision-Memorandum.pdf), so Alternative A: No Action Alternative in this	The No Action Alternative does not represent the minimum legal requirements for avoidance, minimization, mitigation, and monitoring (AMMM) measures and lease stipulations. As stated in PEIS Section 2.1.1, *Alternative A – No Action Alternative*, the No Action Alternative assumes that no offshore wind development occurs on any of the six NY Bight lease areas. The current resource conditions, trends, and impacts from ongoing and planned non-offshore wind and offshore wind activities under the No Action

Comment No.	Comment	Response
	PDEIS should describe how the minimum legal requirements for AMMMs would be met to meet the terms and conditions of that leasing decision. At this point in the decisionmaking process for the NY Bight lease and construction, it is disingenuous to represent not issuing the WTG leases and construction as the No Action Alternative. The content currently described under Alternative A would be more appropriate to describe the existing conditon that would be altered to the extent previously characterized in the EIS for the lease issuance decision and supplemented with new or additional information to document a change in baseline condition.	Alternative serve as the baseline against which the direct and indirect impacts of all action alternatives are evaluated.
BOEM-2024-0001-0471-0006	Agency: NPS Commenter: NPS Section Title: Alternatives Analyzed in Detail Section #: 2.1 Page #: 2-1 On what basis would any COP for WTG construction be rejected?	The purpose of this PEIS is not to approve any projects; the decision to approve, approve with modifications, or disapprove a COP will not occur until after COPs are submitted and another level of NEPA analysis is completed. Any decision to disapprove a COP would be made at that time, and BOEM cannot speculate on what that might be based on.
BOEM-2024-0001-0471-0007	Agency: NPS Commenter: NPS Section Title: Alternatives Analyzed in Detail Section #: 2.1 Page #: 2-1 Figure/Table #: 2-1 Alternative B is not within the range of reasonable alternatives because it does not characterize the minimum legally required AMMMs for leasing and construction of wind farms in the NY Bight. As described in this table, "full build-out of six NY Bight projects without the application of any AMMM measures" should be among the alternatives considered but dismissed if any one AMMM is legally required.	Refer to response to comment BOEM-2024-0001-0371-0004. Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. However, the analysis in Alternative B assumes that development of the NY Bight projects would be required to comply with federal and international requirements.
BOEM-2024-0001-0471-0008	Section Title: Alternatives Analyzed in Detail Section #: 2.1 Page #: 2-1 If a revised Alternative A: No Action Alternative is to represent the minimum legal requirements for AMMMs and any lease stipulations, then revised Action Alternatives could consider any AMMMs that are above and beyond the minimum legally required AMMMs that would further reduce adverse impacts on resources or values at a programmatic level.	BOEM declines to modify the No Action Alternative. As stated in PEIS Section 2.1.1, the No Action Alternative assumes that no offshore wind development occurs on any of the six NY Bight lease areas. The current resource conditions, trends, and impacts from ongoing and planned non-offshore wind and offshore wind activities under the No Action Alternative serve as the baseline against which the direct and indirect impacts of all action alternatives are evaluated. Refer to response to comment BOEM-2024-0001-0371-0004 for additional clarification on Alternative B and Alternative C.

Comment No.	Comment	Response
BOEM-2024-0001-0471-0009	Section Title: Alternatives Analyzed in Detail Section #: 2.1.2.1.1 Page #: 2-5 If BOEM's authority under OCSLA extends only to activities conducted on the OCS, then who would have enforcement responsibilities for the AMMMs to be implemented outside the OCS? How do the cost recovery terms included in the leases reimburse agencies with jurisdiction for enforcement of the AMMMs that are to be implemented outside the OCS	As stated in PEIS Appendix G, not all AMMM measures are within BOEM's statutory and regulatory authority, and those that are not may still be imposed by other governmental agencies. Table G-1 in Appendix G indicates who has the enforcement responsibilities for AMMM measures in the "Anticipated Enforcing Agency" column. Mitigation measures that entail actions outside the Outer Continental Shelf (OCS) have been identified as recommended practices (RPs) and have been moved to Table G-2. If state or other entities choose to enforce these RPs through their respective permitting processes, those agencies would be responsible for the cost of enforcement.
BOEM-2024-0001-0471-0010	Agency: NPS Commenter: NPS Section Title: Transition Interconnection Configurations Section #: 2.1.2.1.1 Page #: 2-13 Line #: 3-8 As stated in this section, there are differing levels of environmental impacts that would result from the various combinations of transmission interconnection configurations. These would have meaningful differences that would provide the foundation for conducting impact analyses. These differences would be more meaningful than the current range of alternatives, where Alternative A has already been dismissed, Alternative B does not account for any legally required AMMMs, and Alternative C simply states that a wide range of AMMMs could become programmatic and applicable to all six leases.	As stated in PEIS Section 1.3, *Purpose of and Need for the Proposed Action*, BOEM's Proposed Action in the Final PEIS is to identify AMMM measures that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. At this programmatic stage, the PEIS does not approve any projects, and BOEM is not considering project-level details or individual alternatives or AMMM measures that are project-specific. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP NEPA stage. RP MUL-18 encourages lessees to coordinate their transmission infrastructure among their projects. Also, refer to response to comment BOEM-2024-0001-0371-0004 for additional clarification on Alternative B and revisions made to Alternative C regarding AMMM measures. Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G that could avoid, minimize, mitigate, and monitor those impacts. However, the analysis in Alternative B assumes that development of the NY Bight projects would be required to comply with federal and international requirements.
BOEM-2024-0001-0471-0011	Agency: NPS Commenter: NPS Section Title: Alternatives Considered but Not Analyzed in Detail Section #: 2.2 Page #: 2-19 Line#: Rows 2-3 Figure/Table#: 2-3	Refer to response to comment BOEM-2024-0001-0471-0010. BOEM does not consider co-location or sharing of corridors as an enforceable AMMM measure. BOEM considers co-locating or sharing of corridors to be an RP and encourages lessees to

Comment No.	Comment	Response
	As stated in this section, there are differing levels of environmental impacts that would result from the various combinations of transmission interconnection configurations. These would have meaningful differences that would provide the foundation for conducting impact analyses. If co-location is to be promoted as a AMMM, then it needs to be analyzed for its benefit relative to not co-locating. As it stands now, this PDEIS dismisses the value of considering if and when co-locating cables or other wind farm-related features would actually result in more significant impacts to the human or natural environments. For example, to what extent would co-locating nearshore cables result in impacts that differ from not co-locating those cables? This analysis would be meaningful to any landowner in the vicinity of proposed cable crossings.	consider RPs in addition to the AMMM measures to further reduce impacts (see PEIS Appendix G, COMFIS-4, MUL-18, and MUL-23). Regarding landowners in the vicinity of cables onshore, as stated in PEIS Section 2.1.2.1.1, because the analysis in the PEIS was prepared before any of the NY Bight COPs were submitted by lessees, actual locations of landfall locations and onshore facilities are unknown at this time. Because the locations of cables on the OCS and those of landfalls and onshore facilities are unknown, the PEIS describes the types of impacts from construction and operation of transmission components generally, and largely defers the more specific analysis of these components and their locations to the COP-specific NEPA documents.
BOEM-2024-0001-0471-0012	Agency: NPS Commenter: NPS Section Title: Alternatives Considered but Not Analyzed in Detail Section #: 2.2 Page #: 2-19 Line #: Rows 2-6 Figure/Table #: 2-3 The rationale for dismissing these alternatives refers the reader back to Alternative C, relying very heavily on the idea that this alternative includes enough AMMMs to avoid speculative and unnecessary analysis. This conclusion can not be made from the range of alternatives presented in the PDEIS. The PDEIS provides no identification of thresholds or considerations for determining when co-locating any element of the wind farm would result in a quantifiable difference in conditions (e.g., temperature increase due to co-locating HVDC converters or not co-locating them). The matrix of AMMMs could be meaningfully different should the transmission interconnection configurations be different.	Refer to response to comments BOEM-2024-0001-0471-0010 and BOEM-2024-0001-0471-0011.
BOEM-2024-0001-0471-0013	Agency: NPS Commenter: NPS Section Title: Non-Routine Activities and Events Section #: 2.3 Page #: 2-21 Although non-routine activities and events are not possible to predict with certainty, are there aspects of how such events would be coordinated among agencies with jurisdiction that should be described in this section as common to all alternatives or aspects that would potentially differentiate the action alternatives?	Non-routine activities and events are analyzed in the PEIS for the resources and impact producing factors (IPF) where they apply and at a level consistent with a programmatic analysis. These activities and events would also be addressed in project-specific COP NEPA documents and may include more detailed information and analysis based on project-specific information. Information on coordination with agencies on these activities and events would be addressed in more detail in project-specific COP NEPA

Comment No.	Comment	Response
		documents when more detail on the offshore and onshore components, including specific locations of project components, is known.
BOEM-2024-0001-0471-0014	Agency: NPS Commenter: NPS Section Title: Summary and Comparison of Impacts by Alternative Section #: 2.4 The purpose of this section is to explain the impacts resulting from implementation of any alternative, summarizing conclusions that can only result after review of Chapters 3 and 4. This summary table could be appropriate to include at the end of Chapter 4 or a new Chapter 5. For Chapter 2: Alternatives, a summary of similarities and differences among the elements of alternatives that are currently detailed in Appendix G would be more informative, particularly because the current range of alternatives relies heavily on illustrating how Alternative C would offset impacts via inclusion of AMMMs programmatically.	Council on Environmental Quality (CEQ) NEPA implementing regulations at 40 Code of Federal Regulations (CFR) 1502.14 requires EISs to present the environmental impacts of the proposed action and alternatives in comparative form in the proposed action and alternatives section of the environmental impact statement (EIS) (PEIS Chapter 2). The impact conclusions presented in Chapter 2, Table 2-4, account for the implementation of AMMM measures under Alternative C. Also, refer to response to comment BOEM-2024-0001-0371-0004 for additional clarification on Alternative B and revisions made to Alternative C regarding AMMM measures.
BOEM-2024-0001-0471-0015	Agency: NPS Commenter: NPS Section Title: Summary and Comparison of Impacts by Alternative Section #: 2.4 Figure/Table #: 2-4 The relative value of implementing any AMMMs under Alternative C is not noticeably different when compared to impacts under Alternative B. Therefore, the basis for which BOEM identified the proposed action is Alternative C remains unclear as it relates to the purpose and need, as other questions listed on page 2-17.	The overall impact rating conclusions (as shown in PEIS Table 2-4 and Executive Summary Table ES-2) may not always be different under Alternative C when compared to Alternative B, while impacts for specific individual IPFs may be different. Depending on the specific IPF and the resource analyzed, there can be notable differences that change the impact determination for a specific IPF under Alternative C (see Lighting IPF in PEIS Section 3.5.3, *Birds*, under Alternative B and Alternative C). However, the overall impact rating conclusions for the resource encompasses all IPF impact conclusions. The details of the analysis for each IPF and the justification for the overall impact conclusion for a resource is found in the Chapter 3, *Affected Environment and Environmental Consequences,* resource sections. The Proposed Action for the Final PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. Refer to response to comment BOEM-2024-0001-0371-0004 for additional clarification on revisions made to Alternative C regarding AMMM measures.

Comment No.	Comment	Response
BOEM-2024-0001-0471-0016	Agency: NPS Commenter: NPS Section Title: Primary IPFs Discharge/Intakes Section #: 3.1 Page #: 3.1-2 Figure/Table #: 3.1-1 Types of discharges from the HVDC converter cooling system should include warmer water and associated thermal effects (according to chapter 2, page 2-8).	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*; *Discharges/intakes,* to further describe the warm water discharges.
BOEM-2024-0001-0471-0017	Section Title: Primary IPFs – Noise Section #: 3.1 Page #:3.1-4 Figure/Table #: 3.1-1 Does noise include broad range of sensitive receptors (e.g., more than human) and in all media (e.g., air, water)?	As described in Table 3.1-1, the Noise IPF captures impacts from both offshore and onshore activities and therefore describes impacts both in the air and water. Potential noise impacts are described for both human and animal receptors in various Chapter 3 resource sections.
BOEM-2024-0001-0471-0018	Agency: NPS Commenter: NPS Section Title: Impact Terminology Section #: 3.3.2 Page #: 3.3-3 Line #: 2 & Footnote Short-term effects are characterized as 3 years in the main text parenthetically and supplemented with a footnote that says 3 to 5 years. Clarification is needed to assist the reader to understand whether impacts that could occur during years 4 and 5 have been described as either short- or long-term effects.	BOEM has revised the parenthetical to include a 3–5 year range based on the footnote.
BOEM-2024-0001-0471-0019	Agency: NPS Commenter: NPS Section Title: Impact Analyses Section #: 3.4 In addition to its land base, NPS has jurisdiction over the water column on the intercoastal waterway side north of Fire Island National Seashore (NS) and jurisdiction from mean high tide to 1000 feet out, including the ocean bottom on the ocean side south of Fire Island. Gateway National Recreation Area (NRA) also includes ocean waters within its boundaries. The potential impacts within the boundaries of Fire Island NS and Gateway NRA from accidental discharges of fuel, trash, debris from construction/operation/ decommissioning, discharge of bilge water and associated invasive species should be addressed. Notification and coordination with Fire Island and Gateway should be included in any proposed mitigation plans (e.g. spill response plans). This should be addressed throughout the DEIS as there are accidental release sections in all Affected Environment sections.	Comment noted. The "Accidental releases" IPF considers the impacts of accidental discharges of fuel, trash, and other debris. This IPF is included in Proposed Action (Alternative C) and alternatives analysis for resources where such impacts would be applicable. In addition, a project-specific COP NEPA review would revisit all potential impacts on land and water areas under NPS jurisdiction should the details in a project-specific COP indicate potential direct or indirect effect on these areas.

Comment No.	Comment	Response
BOEM-2024-0001-0471-0020	Agency: NPS Commenter: NPS Section Title: Impacts of Six Projects Section #: 3.4.1.4.2 Page #: 3.4.1-20 Line #: 4 To what extent would activation of the WTGs likely result in reduction in emission generation by fossil-fuel plants? Does lease, construction, and operation of the WTGs require a reduction in fossil-fuel plant operations? What evidence is used to support statements in this paragraph about electricity pricing, power plant dependence, and decisions to alter existing output or taking plants offline? If no mandate or evidence can support the conclusion that activating WTGs would actually result in a reduction of dependence on fossil-fuel plant operations, then the analysis must focus on how much additional impact would result if WTGs are activated and there is no change in fossil-fuel plant operations. There is too much uncertainty and speculation included in the current analysis to conclude that either Alternative B or C is preferrable to Alternative A.	Leasing, construction, and operation of the wind turbine generators (WTG) do not require a reduction in fossil-fuel plant operations. However, the response of the grid to the introduction of wind energy is market-based: wind energy would displace fossil fuel energy to the extent that it is offered to the grid at a lower price than the bids from fossil-fueled energy sources. BOEM expects that wind energy would be bid at a lower price and consequently would be substituted for and not add to energy from fossil-fueled energy sources. If there were no reduction of fossil-fuel plant operations, then there would be no avoided emissions, and the project emissions would be as shown in Final PEIS Table 3.4.1-6 (*Operations and maintenance emissions from a single NY Bight project*).
BOEM-2024-0001-0471-0021	Agency: NPS Commenter: NPS Section Title: Impacts of Alt C Water Quality Discharges/Intakes Section #: 3.4.2.5.1 Page #: 3.4.2-23 As described on pages 2-7 and 2-8, different equipment would be required on each OSS depending on whether HVAC or HVDC technology is used and HVDC cooling systems may employ an open loop system that discharges warmer water back into the ocean. Although MUL-21 requires the use of the best available technology, it does not exclude the potential use of open loop systems that would have thermal impacts on ocean water quality. These thermal impacts are not quantifiably characterized or analyzed in the PDEIS. The conclusion that measurable impacts are expected to be minimal is unsupported, as no measurements or reference to supporting research has been cited to provide a foundation for this impact analysis. Furthermore, other similar conclusions related to potential discharge impacts (e.g., benthic habitat, sea turtles) are also unsubstantiated.	MUL-21 is now included as an RP in Section 3.4.2.6 (see PEIS Appendix G for descriptions of RPs), but BOEM does encourage lessees to analyze and consider implementing all RPs to reduce impacts on environmental resources. Clean Water Act (CWA) Section 316(b) requires National Pollutant Discharge Elimination System (NPDES) permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific, COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0471-0022	Agency: NPS Commenter: NPS Section Title: Benthic resources geographic analysis area Section #: 3.5.2-2 Figure/Table #: 3.5.2-1	Figure 3.5.2-1 was developed to display the geographic analysis area for benthic resources. Consistent with other figures in the

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	The boundary for Gateway National Recreation Area and Fire Island National Seashore (including waters) should be delineated on this map so proximity to the submarine export cable can be seen; the same is true for other maps that include NPS lands in these documents.	PEIS displaying the geographic analysis area, it does not display site-specific features as that information is not needed and would distract from the purpose of the figure. In addition, as described in Chapter 2, the location of offshore export cables are not known so geographic features potentially affected by the cables cannot be depicted on figures. Future project-specific COP NEPA EIS documents will identify cable corridors and analyze their effects on environmental resources.
BOEM-2024-0001-0471-0023	Agency: NPS Commenter: NPS Section Title: Recreation and Tourism Section #: 3.6.8.1.2 Page #: 3.6.8-3 Line #: 2 Expectations of experiences in National Parks differ from other shoreline areas; therefore, the Peregrine Energy Group Inc (2008) report and other references may not adequately evaluate impacts of visible WTGs on beach use and the visitor experience of cultural landscapes, bathing beaches, night skies, and natural areas within the National Park properties that would be impacted by the proposed project. Gateway National Recreation Area's 2014 General Management Plan (https://www.nps.gov/gate/learn/management/gmp-2012.htm) identifies management zones that provide a spectrum of visitor experiences from developed areas to remote natural areas. Evaluation of the proposed project impacts on recreation and tourism should account for the unique experiences that visitors expect at a coastal National Park and the management zones and range of visitor experiences identified in the Park's 2014 General Management Plan. The General Management Plan identifies darkness and night sky, feelings associated with open space in a high-density area, views of the New York Outer Harbor, contemplation of the physical environment, astronomy, and the beach experience as fundamental resources and values. The same considerations apply at Fire Island National Seashore, including in evaluating the impacts of the project on the Otis Pike Fire Island High Dunes Wilderness.	Refer to response to comment BOEM-2024-0001-0466-0012 concerning visual resources.
BOEM-2024-0001-0471-0024	Agency: NPS Commenter: NPS Section Title: Recreation and Tourism Section #: 3.6.8.1.2 Page #: 3.6.8-4 Line #: 1	Refer to response to comment BOEM-2024-0001-0355-0020.

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	Gateway National Recreation Area's 2014 General Management Plan (https://www.nps.gov/gate/learn/management/gmp-2012.htm) identifies leasing as a primary tool for long-term rehabilitation and preservation of the Park's historic structures. The Park has executed 5 long-term leases for rehabilitation and adaptive re-use of historic structures within the Fort Hancock and Sandy Hook Proving Ground National Historic Landmark District. The Park is currently in negotiations and planning for leasing of more than 20 additional historic structures at Sandy Hook. The Park has issued a long-term lease for the rehabilitation and adaptive re-use of the historic bathhouse at Jacob Riis Park. Several years ago, the Park released a request for interest for leasing historic structures in the Fort Tilden Historic District and the USCG Station Far Rockaway Historic District and plans to move ahead with leasing in those areas of the Park in the future. Preservation of the leased historic structures is dependent upon the economic viability of the leasee. Impacts of the proposed project on recreation and tourism that support the leased facilities will impact the long-term viability of the leased properties and subsequently the capacity of the Park to maintain and preserve the historic structures. Impacts of the proposed project on historic structures within the existing and proposed leasing program should be evaluated in the PEIS.	
BOEM-2024-0001-0471-0025	Agency: NPS Commenter: NPS Section Title: Recreation and Tourism Section #: 3.6.8.1.2 Page #: 3.6.8-4 Line #: 1 Although the New York and New Jersey shores in general have been extensively developed, the shores within National Park Service Units within the project area have not been extensively developed. Visitors come to these National Parks to experience more natural and undeveloped shorelines within the broader more highly developed landscape. Thus the impact of the proposed project on National Park Service Recreation and Tourism cannot be treated the same as the highly developed shoreline areas within the affected environment for recreation and tourism.	Refer to response to comment BOEM-2024-0001-0355-0020.
BOEM-2024-0001-0471-0026	Agency: NPS Commenter: NPS Section Title: Impacts of Alts B and C Recreation and Tourism Section #: 3.6.8.4 and 3.6.8.5	Thank you for the comment. Helicopters, when used, would leave existing airports and follow all transportation/flight path

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	Would use of helicopters be anticipated to occur over NPS lands and waters? PEIS discusses use of helicopters during construction and O&M, which would be over 35 year lifespan of the project. PEIS does not provide characterization of potential noise impacts on NPS natural soundscape at Gateway National Recreation Area (a park fundamental resource) and human receptors enjoying the natural habitats and environments at Gateway National Recreation Area (a park fundamental value). NPS Resource Brief that provides a baseline characterization of the acoustic environs at this park are available in Wood 2015, "Acoustic Environment and Soundscape Resource Summary, Gateway National Recreation Area," accessible at https://irma.nps.gov/DataStore/Reference/Profile/2225921. The park's fundamental resources and values are characterized here: http://npshistory.com/publications/foundation-documents/gate-fd-2017.pdf.	restrictions required by transportation agencies. Most crew transport is expected to occur by vessels. Project-specific NEPA EIS documents will address helicopter use and any potential noise impacts in greater detail.
BOEM-2024-0001-0471-0027	Agency: NPS Commenter: NPS Section Title: Scenic and Visual Resources SLIA Affected Environment Section #: 3.6.9.1.1 Page #: 3.6.9-9 Figure/Table #: Table Footnote Please correct the footnote to state that Gateway National Recreation Area is a unit of the National Park System.	Comment noted and revision has been made.
BOEM-2024-0001-0471-0028	Agency: NPS Commenter: NPS Section Title: Scenic and Visual Resources SLIA Affected Environment Section #: 3.6.9.1.2 Page #: 3.6.9-18 Figure/Table #: 3.6.9-11 The table does not specifically state that there is consideration of both daytime and nighttime experiences for receptors. With approximately 9 million visitors annually, Gateway National Recreation is the 4th most visited park within the National Park System. Evaluation of impacts of the proposed action on scenic and visual resources must recognize that visitors to National Parks expect an experience that is different from many developed shorelines. Gateway National Recreation Area's 2014 General Management Plan (https://www.nps.gov/gate/learn/management/gmp-2012.htm) identifies management zones that provide a spectrum of visitor experiences from developed areas to remote natural areas. Evaluation of the proposed project impacts on the scenic and visual	Thank you for your comment. Table 3.6.9-11 has been revised to recognize National Park visitor experiences and documented dark sky environments. The following language was added to High Sensitivity: “visitors to National Park System sites, where visitors expect a visual and sensory experience emphasizing a unique nature experience, protected views, and dark night skies. Dark sky environment is documented as high quality on the Bortel scale (Bortel 1-2).” The following language was added to Medium Sensitivity: “Dark sky environment is documented as moderate quality on the Bortel scale (Bortel 3-4).”

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	resources and visitor experience should account for the unique experiences that visitors expect at a coastal National Park and the management zones and range of visitor experiences identified in the Park's 2014 General Management Plan. The General Management Plan identifies darkness and night sky, feelings associated with open space in a high-density area, views of the New York Outer Harbor, contemplation of the physical environment, astronomy, and the beach experience as fundamental resources and values.	
BOEM-2024-0001-0471-0029	Agency: NPS Comment #: 27 Commenter: NPS Section Title: Description of the Affected Environment and Future Baseline Conditions Section #: 3.6.21 Page #: 3.6.2-6 When defining "cultural resource" the National Register of Historic Places should be identified as the regulatory basis for physical/tangible resources.	Thank you for this comment, but no changes were made for the following reasons: effects considered under NEPA include historic and cultural (40 C.F.R. § 1508.8); the term "cultural resources" covers a wider range of resources than "historic properties" as defined in 36 CFR 800.16(l)(1), such as sacred sites, archaeological sites not eligible for listing in the National Register of Historic Places, and archaeological collections; and Table 3.6.2-2 provides definitions for both "cultural resources" and "historic properties," with the latter referencing the aforementioned definition included in the Section 106 regulations.
BOEM-2024-0001-0471-0030	Agency: NPS Comment #: 28 Commenter: NPS Section Title: Description of the Affected Environment and Future Baseline Conditions Section #: 3.6.21 Page #: 3.6.2-6 Figure/Table #: 3.6.2-2 Again, when describing marine archeological resources the document is making a tangential reference to the National Register of Historic Places while avoiding any explicit reference. The 50-year time frame is based on the National Register of Historic Places and should be acknowledged.	Thank you for this comment, but no changes were made for the following reason: according to 30 CFR 585.113, "archaeological resource" means any material remains of human life or activities that are at least 50 years of age and are of archaeological interest (i.e., which are capable of providing scientific or humanistic understanding of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques, such as controlled observation, contextual measurement, controlled collection, analysis, interpretation, and explanation). Please also refer to response BOEM-2024-0001-0471-0029.
BOEM-2024-0001-0471-0031	Agency: NPS Comment #: 29 Commenter: NPS Section Title: Description of the Affected Environment and Future Baseline Conditions Section #: 3.6.21 Page #: 3.6.2-8 Line #: 3 and 5 Potential historic properties should be characterized as "unidentified" or "unevaluated", aligning with verbiage used in federal regulations.	Thank you for this comment, but for the purposes of this programmatic NEPA document, the phrase "potential historic properties" in the context of "resources anticipated to be located in the Programmatic Visual APE" is appropriate (see page 3.6.2-8).

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BOEM-2024-0001-0471-0032	Agency: NPS Comment #: 30 Commenter: NPS Section Title: Description of the Affected Environment and Future Baseline Conditions Section #: 3.6.21 Page #: 3.6.2-8 Line #: 3 and 6 As defined by the National Register of Historic Places, property types include more than just buildings. This sentence is awkwardly phrased and does not align with the guidance provided in the NRHP.	Thank you for this comment, but no changes were made for the following reasons: effects considered under NEPA include historic and cultural (40 C.F.R. § 1508.8); the term “cultural resources” covers a wider range of resources than “historic properties” as defined in 36 CFR 800.16(l)(1); and the sentence already references non-building property types, including cultural landscapes and traditional cultural places.
BOEM-2024-0001-0471-0033	Agency: NPS Comment #: 31 Commenter: NPS Section Title: Description of the Affected Environment and Future Baseline Conditions Section #: 3.6.21 Using this document to tier the identification and analysis of impacts to cultural resources is negated by the fact that we lack sufficient information to allow for any of the prescribed process to occur at this early stage.	The programmatic approach is not intended to analyze impacts on specific cultural resources. The identification and specific analysis of effects on cultural resources will be required as part of each developer’s COP submission. The programmatic effort establishes a prescribed process to be applied to the analysis that will be required as part of that later stage of COP environmental review. BOEM is meeting the reasonable, good faith effort standard.
BOEM-2024-0001-0471-0034	Agency: NPS Comment #: 32 Commenter: NPS Section Title: Impact Level Definitions to Cultural Resources Section #: 3.6.22 Page #: 3.6.2-9 Figure/Table #: 3.6.2-3 The impact levels as correlated to an adverse effect versus a no adverse effect finding is narrowly defined and the framework is flawed. These categories don't translate to how impact assessments are made in real-world scenarios and are weighted towards a no adverse effect determination.	BOEM applies the National Historic Preservation Act (NHPA) Section 106 definition (36 CFR 800.5(a)(1)) of an adverse effect. Each undertaking has one effect finding. Through this analysis, individual properties are evaluated in the areas of potential effects (APEs) to make this one finding for the undertaking. Therefore, BOEM will make a finding of adverse effect for the undertaking even when some historic properties are not adversely affected but one or more historic properties are adversely affected. Procedurally, BOEM needs to provide this step in the event that there is a no adverse effect finding for the undertaking; however, none of the previous COP reviews to date have resulted in a finding of no adverse effect for the undertaking.
BOEM-2024-0001-0471-0035	Agency: NPS Comment #: 33 Commenter: NPS Section Title: Impact Level Definitions to Cultural Resources Figure/Table #: 3.6.2-3 The definition and criteria used for major impacts to cultural resources that “could” result in an adverse effect determination misrepresents the definition as stated in the federal regulations. Major impacts would result in an adverse effect and don’t have to impact all seven aspects of integrity, as noted in the table, to result in an adverse effect finding. The level of impacts presented in the table	BOEM would like to clarify that Table 3.6.2-3 reads “could occur,” not “could result in an adverse effect determination.” If there is a potential for an adverse effect, then the lead federal agency can make a finding of an adverse effect. This table defines the levels of potential impacts on cultural resources and is intended to cross-walk the potential scenarios resulting in findings between NEPA and NHPA. Furthermore, the description of major impacts as applied to historic properties under Section 106 of the NHPA does

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	provides a level of latitude that does not align with codified federal regulations.	not require all seven aspects of integrity to be diminished to result in an adverse effect finding, as the comment states.
BOEM-2024-0001-0471-0036	Agency: NPS Comment #: 34Commenter: NPS Section Title: Cumulative Impacts of the No Action Alternative Section #: 3.6.2.3.2 Page #: 3.6.2-13 Line #: 3 and 9 The National Historic Preservation Act was enacted in 1966 and subsequently amended four times: 1976 (Pub. L. No. 94-422, 90 Stat. 1320), 1980 (Pub. L. No. 96-515, 94 Stat. 2987), 1992 (Pub. L. 102-575, 106 Stat. 4753), and 2016 (Pub. L. No. 96-515).	Thank you for the information about the NHPA.
BOEM-2024-0001-0471-0037	Agency: NPS Comment #: 35 Commenter: NPS Section Title: Cumulative Impacts of the No Action Alternative Section #: 3.6.2.3.2 Page #: 3.6.2-13 Line #: 3 and 7 If submerged maritime archeological resources at Gateway National Recreation Area waters were to be adversely impacted by activities, mitigative measures could be applied to other GATE resources if mitigating impacts to a particular maritime archeological resource is truly undoable, and as determined through consultation.	Thank you for this comment. BOEM will consult with NPS if there are any impacts on individual NPS units at the COP NEPA stage. As appropriate, BOEM will consider creative mitigation measures through consultation with the NPS for any historic properties that are adversely affected in NPS units.
BOEM-2024-0001-0471-0038	Agency: NPS Comment #: 36 Commenter: NPS Section Title: Socioeconomic Conditions and Cultural Resources Section #: 3.6.8.1.1 Page #: 3.6.8-2 Figure/Table #: 3.6.8-1 The delineated boundary excludes the bay abutting Staten Island and potentially impacted recreational areas in the vicinity, specifically those associated with Gateway National Recreaton Area. It's not clear why Staten Island is included but not associated waters.	Thank you for your comment. The waters of the Gateway National Recreation Area are not included because BOEM does not anticipate that the offshore wind activities would impact the recreation and tourism quality of those waters. The waters of that area are included in other resource assessments.
BOEM-2024-0001-0471-0039	Agency: NPS Comment #: 37 Commenter: NPS Section Title: Socioeconomic Conditions and Cultural Resources Section #: 3.6.9.1 Page #: 3.6.9-7 Figure/Table #: 3.6.9-4 Fort Tilden Historic District and the Floyd Bennet Field are both missing from the map. Ensure that all Gateway NRA historic districts are reflected on the map.	Thank you for your comment. These sites have been added to Figure 3.6.9-7 and the more detailed maps in Appendix H, specifically Figures H-2, H-7, H-8, and H-13. Figure 3.6.9-7 shows the entire geographic analysis area; therefore, some of these smaller NPS sites are not visible at this scale.
BOEM-2024-0001-0471-0040	Agency: NPS Comment #: 38 Commenter: NPS Section Title: Socioeconomic Conditions and Cultural Resources Section #: 3.6.2 Page #: 3.6.2-1 Consider a heavy rewrite of this section in general. There are	Thank you for your comment. The commenter does not pose a question or raise specific issues with the environmental analysis.

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	recurring issues with basic concepts regarding cultural resource management and historic preservation that are not accurately presented in the narrative.	
BOEM-2024-0001-0471-0041	Agency: NPS Commenter: NPS Section Title: Socioeconomic Conditions and Cultural Resources Section #: 3.6.2 Page #: 3.6.2-2 If "BOEM expects each lessee to complete the requisite cultural resource technical studies" National Criteria for Evaluation should be used. Maintaining consistency across individual evaluations will be key. preliminary APE (PAPE) per the COP PDE, completion of associated cultural resource and historic property identification efforts, assessment of potential effects, and development of potential AMMM measures for identified historic properties.	As stated in the *Draft Programmatic Agreement Among The U.S. Department of the Interior, Bureau of Ocean Energy Management; The State Historic Preservation Officers of New York and New Jersey; and The Advisory Council on Historic Preservation Regarding Six Renewable Energy Projects (Leases OCS-A 0537, 0538, 0539, 0541, 0542, and 0544) Offshore New York and New Jersey Under Section 106 of the National Historic Preservation Act* (hereafter, the Draft Programmatic Agreement for the NY Bight), and consistent with all other offshore wind COP approval requirements, lessees are required to identify historic properties in the marine, terrestrial, and visual APEs; assess potential effects; and propose AMMM measures. These reports are then consulted upon during the Section 106 consultation. The cultural resource technical studies are required to meet the "reasonable and good faith effort" described in 800.4(b)(1) and to follow BOEM's "Guidelines for Providing Archaeological and Historic Property Information" as well as all applicable state guidelines and requirements. Additional information can be found in Stipulation I.B of the Draft Programmatic Agreement for the NY Bight.
BOEM-2024-0001-0471-0042	Agency: NPS Commenter: NPS Section Title: Socioeconomic Conditions and Cultural Resources Section #: 3.6.2 Page #: 3.6.2-3 The primary objective of the programmatic Section 106 review is to provide an opportunity for Section 106 consulting parties to identify historic properties early in project planning that could be avoided and/or minimized from project impacts and consult on and identify a consistent Section 106 consultation process that will allow Tribal Nations and consulting parties to consult as early as possible for each of the six project-level reviews.	Thank you for the comment. The commenter does not pose a question or raise issues with the environmental analysis. While the Section 106 Programmatic Agreement provides for a consistent review and consultation process for each of the six COP NEPA reviews, BOEM does not intend to identify any specific historic properties through this programmatic evaluation. Developers of individual leases will be required to undertake comprehensive identification of historic properties within the marine, terrestrial, and visual APEs, and BOEM will assess the effects of each project on those identified historic properties during the COP NEPA reviews and related consultations.
BOEM-2024-0001-0471-0043	Agency: NPS Commenter: NPS Section Title: Socioeconomic Conditions and Cultural Resources Section #: 3.6.2 Page #: 3.6.2-3	Thank you for your comment. Please refer to Stipulation I.B.2 through I.B.5 in the Draft Programmatic Agreement for the NY

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	In order to execute the PA and potential future MOA(s), APEs must be firmly established in order to identify all possibly impacted cultural resources. Please clarify.	Bight for the details of how the APEs for each project will be delineated during the COP stage reviews.
BOEM-2024-0001-0471-0044	Agency: NPS Commenter: NPS Section Title: Impact Level Definitions to Cultural Resources Section #: 3.6.2.2 Page #: 3.6.2-10 Figure/Table #: Table 3.6.2-4 Issue of what is later described as "accidental releases" such as unanticipated disturbance from fuel spills and associated cleanup activities should be added to this table.	Table 3.6.2-4 summarizes high-level disturbances. Accidental releases are classified under IPFs and are included in offshore seabed disturbance later in the text of Section 3.6.2.3 for Alternative A, Section 3.6.2.4.1 and 3.6.2.4.3 for Alternative B, and Section 3.6.2.5.1 for Alternative C (Proposed Action).
BOEM-2024-0001-0471-0045	Agency: NPS Commenter: NPS Section Title: Cumulative Impacts of the No Action Alternative Section #: 3.6.2.3.2 Page #: 3.6.2-17 Under 'Presence of Structures,' could they also be characterized as permanent intrusive visual elements to the viewsheds of cultural resources? Or is there a plan to remove them after their life cycle? Please clarify.	There is an expected lifecycle of these projects; see Decommissioning in Chapters 2 and 3. These are not considered permanent structures for the purposes of this PEIS. Lessees can request that facilities remain in place in the decommissioning application submitted to the U.S. Department of the Interior Bureau of Safety and Environmental Enforcement (BSEE (30 CFR 285.900-285.913), but BOEM approves or does not approve the request (30 CFR 585.434). Unless otherwise determined during the decommissioning application review, NY Bight lessees would be required to remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seabed of all obstructions created. Conceptual decommissioning would typically follow a “reverse installation” process, with turbine components or the offshore substation (OSS) topside structure removed prior to foundation removal.
BOEM-2024-0001-0471-0046	Agency: NPS Commenter: NPS Section Title: Cultural Resources Section #: 3.6.2 Page #: 3.6.2-16 Document states: "The impacts of construction and operational lighting would be limited to cultural resources subject to visual impacts and for which a dark nighttime sky is a contributing element to historical integrity." NPS disagree. We have raised this general issue with BOEM before on various wind project. Please consult with NPS Cultural Resource Specialists. NPS suggested rewording statements about night sky quality and protection being limited only to those cultural resources where was called out in the national register listing of the property. The night sky as an integral part of the	BOEM is demonstrating a reasonable and good faith effort with identifying and evaluating potential historic properties pursuant to the Section 106 regulations and is not required to evaluate if a dark night sky is a character-defining feature of each individual resource at this programmatic stage. BOEM will continue to consult with NPS cultural resource specialists regarding any potential concerns regarding nighttime operational lighting. The use of the term "cultural resources" was chosen by BOEM to reflect a broader range of resources than would be suggested by the use of the term historic properties and because it is a term used in NEPA. Please refer to the CEQ Advisory Council on Historic

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	cultural landscape and its importance was not acknowledged back when many historic properties were evaluated for the National Register. Now we know that the night sky resource is an integral component of the overall setting and feel of a historic property and/or cultural landscape, and can be of ethnographic importance and value to indigenous peoples. Dark skies / cultural landscapes are important to all historic sites, whether or not dark skies were recognized independently during designation of historic sites.	Preservation (ACHP) handbook, which defines key terms in NEPA and Section 106 reviews [https://www.achp.gov/integrating_nepa_106]. BOEM notes that it agrees with the NPS characterization of earlier National Register of Historic Places (NRHP) nominations as not being the only source of information for evaluating historic properties. BOEM does not solely rely on the character-defining features identified in NRHP nominations to determine whether a project would have an adverse effect on a particular historic property.
BOEM-2024-0001-0471-0047	Agency: NPS Commenter: NPS Section Title: Cultural Resources Section #: 3.6.3 Page #: 3.6.2-17 It's great to see that benefits of using ADLS are mentioned here. NPS would like to see the developer is committed in using ADLS.	Thank you for this comment. The Draft Programmatic Agreement for the NY Bight Appendix IV includes Aircraft Detection Lighting Systems (ADLS) as a standard minimization measure. At this programmatic evaluation stage, there are no COPs under review. ADLS will continue to be a standard minimization measure at the COP-level review stage.
BOEM-2024-0001-0471-0048	Agency: NPS Commenter: NPS Section Title: Scenic and Visual Resources Section #: 3.6.9 Include nighttime simulations for Fire Island or Sandy Hook, as the current PEIS does not. As those two units/locations are the most likely to be impacted, those visuals would be crucial for informing a decision. Moreover, the Wilderness area is one of the key resources at Fire Island likely to be impacted, yet there are no visual simulations from within the wilderness itself.	Nighttime simulations were created for Key Observation Point (KOP)-38 Robert Moses Field 5, which is less than a mile from Fire Island Lighthouse. Although 14.5 miles south of more sensitive wilderness environments on Fire Island, KOP-38 is 2 and 7 miles closer to lease area OCS-A 0544 and Empire Wind (OCS-A 0512), respectively, making it a more conservative point for comparison. KOP-38 is comparable to Sandy Hook for understanding nighttime impacts from Empire Wind but is 45 miles from NY Bight lease area OCS-A 0544. For the COP-level NEPA stage, additional analysis and KOPs will be considered.
BOEM-2024-0001-0471-0049	Agency: NPS Commenter: NPS Section Title: Scenic and Visual Resources Section #: 3.6.9 The potential cumulative impacts of all 6 areas within the Bight being developed seems significant, even with mitigation measures. Do they have a procedure for addressing cumulative effects, as individual development plans are proposed and, especially, if approved?	Cumulative impacts are analyzed for each alternative in Chapter 3.6.9 and in Appendix H.4. Table 3.6.9-27 and 3.6.9-28 show the additive changes as other leases areas are constructed for each NY Bight WTG height. To consider the six NY Bight projects from a cumulative perspective for Alternative B, please see Section 3.6.9.4.2, Impact of Six Projects. Because the NY Bight leases are far from shore (the closest distance is 20 nautical miles [37 kilometers] and the average distance is 32 nautical miles [59 kilometers]), their individual and collective visibility is greatly reduced. See Table 3.6.9-16, Magnitude of View Summary.

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BOEM-2024-0001-0471-0050	Agency: NPS Commenter: NPS Section Title: Scenic and Visual Resources Section #: 3.6.9 Please provide an ADLS efficacy analysis so that the impact from the flashing red lights can be quantified for the cases with and without ADLS.	Thank you for your comment. An efficacy analysis on an ADLS was not completed specifically for the programmatic evaluation of NY Bight. Nighttime visual impact is based on visual simulations and analysis of ADLS effectiveness conducted for Atlantic Shores South and Empire Wind (See Section 3.6.9.5, Impacts of Alternative C – Lighting). Impacts are based on 2018–2019 air traffic over the nearby Atlantic Shores South (OCS-A 0499) and Empire Wind (OCS-A 0512) lease areas, which are representative of New Jersey and New York, respectively, and hours of sunlight and darkness. The Atlantic Shores South (OCS-A 0499) ADLS-controlled obstruction lights would be activated for 9 hours over a 1-year period, 1 percent of the normal operating time that would occur without ADLS (Atlantic Shores 2022). The Empire Wind (OCS-A 0512) ADLS-controlled obstruction lights would be activated for 357 hours, 46 minutes, and 45 seconds over a 1-year period, 7.5 percent of the normal operating time that would occur without ADLS (Equinor 2022). A single NY Bight project is estimated to have similar or fewer shorter-duration synchronized flashing of ADLS, as compared to the standard continuous, medium-intensity red strobe U.S. Department of Transportation Federal Aviation Administration (FAA) warning system. The ADLS aviation hazard lighting would be in use for the duration of operations and maintenance (O&M) of any of the NY Bight projects. VIS-7 would establish monitoring requirements for ADLS to determine the frequency of use and effectiveness of the ADLS system. The potential visibility of aviation lights is documented in Table H-42 and H-43 at Key Observation Points for each lease area and for each WTG height. In addition, the photo simulations available on the BOEM website (https://www.boem.gov/renewable-energy/state-activities/new-york-bight) quantify the number of WTG hubs (where the aviation light is located) visible for each KOP by lease area. An analysis of lighting effects will be conducted at the project-level NEPA stage and would include an analysis of ADLS lighting, if such lighting is part of the COP.

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BOEM-2024-0001-0471-0051	Agency: NPS Commenter: NPS Viewshed impacts to FIIS Visual impacts were identified from the Fire Island Lighthouse and it is also stated that the structures would be visible from Watch Hill. This means that there will also be viewshed impacts to the Carrington Estate (NHPA listed) and the Fire Island Otis Pike wilderness area. BOEM is encouraged to use the visual impact analysis for Fire Island from Empire Wind 1 and 2 for the NY Bight Draft Programmatic EIS and to incorporate this analysis into an updated impact analysis for NHPA-listed properties.	Please see response to comment BOEM-2024-0001-0466-0011. At this programmatic stage, BOEM is not making any findings of effect on historic properties, including Fire Island Lighthouse. Findings of effect will occur during COP-level NEPA and NHPA Section 106 review.
BOEM-2024-0001-0471-0052	Agency: NPS Commenter: NPS Onshore cable impacts onshore cable locations are not discussed in this document. Given the potential impact that these connected onshore activities could have, we request that any landfall connections and related activities be explicitly excluded from NPS administered lands and existing or proposed designated wilderness areas to preserve the integrity of these protected lands and the purposes of the parks.	Thank you for the comment. Landfall locations for cables will be addressed in project-specific NEPA EIS documents. The PEIS does not have these locations to evaluate them.
BOEM-2024-0001-0471-0053	App D Planned Activities Agency: NPS Commenter: NPS Section #: D.2.9 Page #: D-14 Given the anticipated take of marine mammals resulting from implementation of the proposed action, the NPS and BOEM would need to establish an agreement or understanding to coordinate marine mammal stranding response activities (e.g., biological sample collection, euthanization, carcass burial, Tribal government consultations, cost recovery) that may occur on NPS lands and waters.	BOEM encourages NPS to reach out directly to the National Marine Fisheries Service (NMFS) regarding marine mammal stranding response on NPS properties. BOEM proposed activities are not anticipated to result in any stranding of marine mammals.
BOEM-2024-0001-0471-0054	App G Mitigation and Monitoring Agency: NPS Commenter: NPS Section #: 1 Page #: G-1 The assemblage of AMMMs presented is diverse, comprising at least four distinct categories: 1. Within a Federal agency's statutory and regulatory authority; 2. Mitigations required under NHPA Section 106; 3. Enforceable under state permitting requirements; 4. Voluntary. This paragraph explains that at some future time, BOEM may determine that any or all AMMMs might not be included in leases if a COP-analysis finds that implementation of such measure is not warranted or effective. Thus, it becomes very difficult (if not	BOEM has reviewed and considered public comments on AMMM measures and revised the measures as presented in Appendix G. In an effort to create a more efficient process, the PEIS analyzes AMMM measures that are commonly applied through the COP NEPA stage process. The Final PEIS would signal to lessees which AMMM measures would apply to one or more of the NY Bight projects. Refer to response to comment BOEM-2024-0001-0406-0004 regarding the revision of the purpose and need in the Final PEIS.

Comment No.	Comment	Response
	impossible) to understand how analysis of these AMMMs as part of Alternative C is meaningfully different from Alternative B.	
BOEM-2024-0001-0471-0055	Agency: NPS Commenter: NPS Section #: 3 Page #: G-1 How are the "Previously Applied as a COP Term and Condition" AMMMs relevant to the current PDEIS and/or leases issued for the NY Bight? These are terms and conditions of leases beyond the scope of this PDEIS, and the basis for their inclusion in any other BOEM-issued leases or relevance to any current/future leases in the NY Bight is not obvious or explained. Are these the lease stipulations (section 6 of https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/ATLW-8-NY-Bight-Final-Lease-Sale-Decision-Memorandum.pdf)? If so, they should be used to provide the foundation upon which the No Action Alternative is developed.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0471-0056	Agency: NPS Commenter: NPS Section #: 4 Page #: G-1 Line #: 3 What monitoring duration would be required to determine that any single AMMM could or should be excluded from the AMMMs as not warranted or ineffective, and therefore excluded from COP-specific NEPA analysis? How would potentially lengthy transient dynamics be considered in the decisionmaking process of determining which AMMMs are deemed unwarranted or ineffective? What qualitative and quantitative thresholds, or metrics, would be used to conclude any particular AMMM would be unwarranted or ineffective?	In an effort to create a more efficient process, the PEIS analyzes AMMM measures that are commonly applied through the COP NEPA process. The Final PEIS would signal to lessees which AMMM measures would apply to one or more of the NY Bight projects. Refer to response to comment BOEM-2024-0001-0406-0004 regarding the revision of the purpose and need in the Final PEIS.
BOEM-2024-0001-0471-0057	Agency: NPS Commenter: NPS Page #: G-3 Line #: BB-3 Listed mitigation does not include painting one rotor black to enhance rotor visibility to birds, which has been shown to decrease collisions by 70%. May, Roel, T. Nygard T, U. Falkdalen, J. Astrom, O. Hamre, and B. G. Stokke. 2020. Paint it black; Efficacy of increased wind turbine rotor blade visibility to reduce avian fatalities. Ecology and Evolution. 10; 89278935	Thank you for the suggestion. The recent study (May et al 2020) found that painting a single blade black reduced eagle mortality at a land-based wind farm in Europe. Although promising, the study was small and needs to be replicated. Approximately a year ago, a similar study (https://rewi.org/2024/01/24/painted-blade-study/) was started in the United States that BOEM will continue to monitor through the COP NEPA stage.
BOEM-2024-0001-0471-0058	Agency: NPS Commenter: NPS Page #: G-35 Line #: VIS-7 For work with potential impacts on NPS lands and waters, project shall comply with NPS and park lighting guidelines to reduce impacts to the night sky and wildlife. This will include, but is not limited to, energy efficient light sources in warm color hue such as amber or	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0466-0036.

Comment No.	Comment	Response
	yellow (2700K or warmer); shielding to direct light downward; lowest lumens possible; and fixtures with adaptive technology controls such as timers, motion detectors, hue adapters, and dimmers.	
BOEM-2024-0001-0471-0059	Agency: NPS Commenter: NPS How would new AMMMs be incorporated programmatically to the NY Bight leases?	As noted in Section 1.3, *Purpose and Need for the Proposed Action*, BOEM is evaluating as part of the PEIS AMMM measures that BOEM may require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas. Refer to response to comment BOEM-2024-0001-0406-0004 regarding the revision of the purpose and need in the Final PEIS.
BOEM-2024-0001-0471-0060	AppH SLVIA Agency: NPS Commenter: NPS Section Title: Visual Impact Assessment Section #: H.3.2.1 Page #: H-78 Figure/Table #: H-33 The Sandy Hook Light is missing from the table. Please add. Agency: NPS Commenter: NPS Section Title: Magnitude Section #: H.3.2.2 Page #: H-80-81 Figure/Table #: H-34 and H-35 The Sandy Hook Light is missing from the table. Please add.	Forty KOPs were initially identified for analysis during scoping. Following the analysis, eight of these KOPs appeared outside of the affected viewshed and have been removed from the impact analysis. KOP-20 Sandy Hook Beach and KOP-34 Sandy Hook Observatory were two of the eight removed.
BOEM-2024-0001-0471-0061	Appl NHPA Summary Agency: NPS Commenter: NPS Section Title: NY Bright Programmatic Visual Impact Analysis Key Observation Points Section #: I.2.4.1 Page #: I-18 Figure/Table #: Table I-4 KOP No. 20 Sandy Hook Lighthouse NHL needs a simulation both during clear and cloudy days and nights.	The visual simulations presented in the Programmatic Visual Impact Analysis are examples and are not fully representative of all affected resources. Individual COP-level analysis will provide additional visual assessments, which may include daytime and nighttime simulations.
BOEM-2024-0001-0471-0062	Agency: NPS Commenter: NPS Section Title: Background Section #: I.1.1 Page #: I-1 Baseline data is information often employed to compare other data acquired afterward. It serves as a foundation of projects. Since "BOEM will not have the results of archaeological surveys prior to the issuance of leases or grants and, as such, will be conducting historic property identification and evaluation efforts in phases" the information gathered is unlikely to serve as a true baseline.	Appendix I, Section I.1.1 states that the current programmatic review of the six New York Bight leases “seeks to compile baseline information, where feasible,” which does not indicate the intention to compile a comprehensive and final baseline as that is not feasible at this programmatic stage.
BOEM-2024-0001-0471-0063	Agency: NPS Commenter: NPS Section Title: Programmatic Area of Potential Effect Section #: I.1.3 Page #: I-4	Thank you for this comment, but it is not clear which part of the text is of concern. As a result, no changes were made.

Comment No.	Comment	Response
	National Criteria for Evaluation as described by the National Register of Historic Places should prevail when lessees complete the requisite cultural resource technical studies.	
BOEM-2024-0001-0471-0064	Agency: NPS Commenter: NPS Section Title: Marine Portion of the Programmatic APE Section #: I.1.3.1 Page #: I-7 Basing adverse effects on typical hypothetical activities cannot accurately reflect impacts.	Thank you for this comment, but BOEM does not intend to identify any specific impacts through this programmatic evaluation, as this evaluation does not yet include individual COPs. Developers of individual leases will be required to thoroughly propose processes, locations, schedules, and other pertinent data, and BOEM will assess the impacts of project activities at that time.
BOEM-2024-0001-0471-0065	Agency: NPS Commenter: NPS Section Title: Terrestrial Portion of Programmatic APE Section #: I.1.3.2 Page #: I-7 The terrestrial portion discussion fails to account for impacts other than ground disturbing activities, whereas elsewhere mitigations are discussed for "screening" of above ground components. Please resolve this issue in the document.	The Terrestrial APE only considers terrestrial ground disturbance with the potential to disturb archaeological historic properties. It is unclear from this comment how "screening" aboveground resources is relevant to protecting archaeological historic properties; therefore, no changes were made.
BOEM-2024-0001-0471-0066	Agency: NPS Commenter: NPS Section Title: Historic Aboveground Resources Section #: I.3.4 Page #: I-15 Under point no. 2 please make edits to "views and vistas" to more precisely define the differences between these two features.	Appendix I Section I.3.4 was revised to remove the word "vistas."
BOEM-2024-0001-0471-0067	Agency: NPS Commenter: NPS Section Title: Historic Aboveground Resources Section #: I.3.4 Page #: I-15 Under no. 5 add design to the aspects of integrity that could be impacted since a "vista" is a deliberate and controlled via design elements.	Please refer to the response to comment BOEM-2024-0001-0471-0066.
BOEM-2024-0001-0471-0068	Agency: NPS Commenter: NPS Section Title: NY Bright Programmatic Visual Impact Analysis Key Observation Points Section #: I.3.4.1 Page #: I-18Figure/Table #: I-4 The correct name of the NHL is the "Sandy Hook Light". Please make this correction.	Thank you for this comment. The name for Sandy Hook Light was revised.
BOEM-2024-0001-0471-0069	Agency: NPS Commenter: NPS Please include Sandy Hook Proving Ground NHL district.	Thank you for this comment. Sandy Hook Proving Ground Historic District is noted to be a National Historic Landmark (NHL); however, Table I-4 only includes NHLs that are also KOPs. At this time, Sandy Hook Proving Ground Historic District is not a KOP due to the close proximity of Sandy Hook Light, which is a KOP.

Comment No.	Comment	Response
BOEM-2024-0001-0471-0070	App K References Agency: NPS Commenter: NPS Page #: K-1 BOEM 2019 hyperlink (https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/IPFs-in-the-Offshore-Wind-Cumulative-Impacts-Scenario-on-the-N-OCS.pdf.) did not function properly because the period at the end of the URL was included.	Hyperlink for BOEM 2019 citation on page K-1 has been revised.

Table P.4-2. Responses to Comments from the National Park Service (BOEM-2024-0001-0466)

Comment No.	Comment	Response
BOEM-2024-0001-0466-0001	[Bold: Comments] We are concerned that the DPEIS may be fatally flawed because it does not provide a range of reasonable alternatives. Alternative A (No Action Alternative) does not align with existing condition characterized in the EIS for the lease issuance decision. Alternative B does not characterize the minimum legally required AMMMs for leasing and construction of wind farms in the NY Bight and Alternative C is not noticeably different in impacts (when compared to Alternative B) so basis for selection of that alternative as proposed action is unclear. More specific comments are provided on the DPEIS tab of the excel file. If the DPEIS alternatives are flawed then tiered compliance would also be flawed. In addition, if the DPEIS is flawed NPS would not be able to adopt BOEM compliance if authorization of project elements on NPS lands is necessary. Related to the above paragraph and detailed in our comments in the spreadsheet the DPEIS is not well grounded in law and does not identify minimal legal requirements.	The analysis in the PEIS is not flawed. The No Action Alternative presents the potential impacts associated with ongoing and future activities absent the development of offshore wind in the NY Bight lease area. This has been updated to reflect the most current information going into the Final PEIS. BOEM has provided additional clarification on the purpose of Alternative B (see PEIS Chapter 2). Alternative B serves to compare how impacts would change with AMMM measures analyzed in Alternative C. Alternative B considers the potential impacts of future offshore wind development for the NY Bight area without the AMMM measures identified in Appendix G, *Mitigation and Monitoring*, that could avoid, minimize, mitigate, and monitor those impacts. However, the analysis in Alternative B assumes that development of the NY Bight projects would be required to comply with federal and international requirements. The PEIS will not result in the approval of any activities. As detailed in the PEIS, Alternative C may or may not be noticeably different than Alternative B. Depending on the specific IPF and the resource analyzed, there can be notable differences that can change the impact determination for an IPF under Alternative C (see Lighting IPF in PEIS Section 3.5.3, *Birds*, under Alternative B and Sub-alternative C1).

Comment No.	Comment	Response
		Regarding the potential effects on National Park Service Lands and adopting BOEM compliance, because details on locations of onshore project components are not known for this programmatic environmental review, details on resource impacts, including any on National Park Service lands, are also not known in detail. These specific impact details would be assessed in project-specific COP NEPA documents for NY Bight lease areas that might be developed in the future. The AMMM measures in Alternative C are considered programmatic insofar as they may be applied to COPS for the six NY Bight lease areas, not because they necessarily will apply to COPs under BOEM's renewable energy program outside of the NY Bight lease areas. BOEM has modified the PEIS language describing the Proposed Action and refined language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing a presumption at COP review that a lessee would need to rebut—but is identifying those AMMMs that BOEM may impose at the COP NEPA stage. By identifying and analyzing those AMMMs now, the expectation is that the analysis at the COP NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0466-0002	Given the potential impact that these connected onshore activities could have we request that any landfall connections and related activities be explicitly excluded from NPS administered lands and existing or proposed designated wilderness areas to preserve the integrity of these protected lands and the purposes of the parks.	Comment noted. Specific landfall connections will be determined at the COP NEPA stage and can be further discussed at that time.
BOEM-2024-0001-0466-0003	Visual impacts were identified from the Fire Island Lighthouse and it is also stated that the structures would be visible from Watch Hill. This means that there will also be viewshed impacts to the Carrington Estate (NHPA listed) and the Fire Island Otis Pike wilderness area. BOEM is encouraged to use the visual impact analysis for Fire Island from Empire Wind 1 and 2 for the NY Bight DPEIS and to incorporate this analysis into an updated impact analysis for NHPA-listed properties.	Thank you for your comment. For the COP-level NEPA stage, additional analysis will be considered. Visual impacts from the Carrington House can be correlated to KOP-37 Point O'Woods, which is approximately 2.88 miles southwest. At this programmatic stage, BOEM is not making any findings of effect on historic properties, including Fire Island Lighthouse. Findings of effect will occur during COP-level NEPA and NHPA Section 106 review.
BOEM-2024-0001-0466-0004	As requested in our previous letters Fire Island National Seashore and Gateway National Recreation Area should be identified on all the	Thank you for this suggestion, but BOEM does not intend to identify any specific historic properties through this programmatic

Comment No.	Comment	Response
	maps that show the NY Bight. The boundary of each park unit and its various districts should be outlined and labeled including boundaries as they extend into ocean and bayside waters. We also request that point locations are included for all National Historic Landmark (NHL) locations. We can assist in providing location data to fulfill this request.	evaluation. Developers of individual leases will be required to undertake comprehensive identification of historic properties within the marine, terrestrial, and visual APEs, and BOEM will assess the effects of each project on those identified historic properties during the COP-level reviews.
BOEM-2024-0001-0466-0005	[Bold: NPS Units and Program Lands in the NY Bight] NPS manages two National Parks in the NY Bight Fire Island National Seashore and Gateway National Recreation Area and has program responsibilities for numerous National Historic Landmarks (NHLs) in the NY Bight identified pursuant to the National Historic Preservation Act of 1966 (NHPA) (54 U.S.C. 300101 et seq.). NPS has provided information on each of these areas below to satisfy BOEM's request for information on the topics listed in the NOI including a) biological resources including bats birds coastal fauna finfish invertebrates essential fish habitat marine mammals and sea turtles; b) physical resources and conditions; and c) socioeconomic and cultural resources including land use and coastal infrastructure recreation and tourism and scenic and visual resources as applicable and would like this information added where appropriate to the DPEIS.	Thank you for your comment. BOEM recognizes that there are numerous recreation areas and historic landmarks throughout the geographic analysis area for this PEIS, too many to name and characterize them all. For this PEIS, BOEM did not list and assess each one individually to the level of detail as will be required in a project-specific COP NEPA analysis. At that stage, additional project specifics (e.g., locations, size, timing) will be known that will enable that level of analysis for each of the six NY Bight lease areas.
BOEM-2024-0001-0466-0006	[Bold: Overview of Fire Island National Seashore] Fire Island National Seashore (the Seashore) lies along the south shore of Long Island in Suffolk County New York. The Seashore encompasses 19580 acres of upland tidal and submerged lands along a 26- mile stretch of the 32-mile barrier island part of a much larger system of barrier islands and bluffs stretching from New York City to the very eastern end of Long Island at Montauk Point. Easily accessed on Fire Island are nearly 1400 acres of federally designated Wilderness (The Otis Pike Fire Island High Dune Wilderness) that include an extensive dune system centuries-old maritime forests and solitary beaches. On the western end of the Seashore is the Fire Island Lighthouse. Nearby on Long Island adjacent to the Village of Mastic Beach the 613-acre William Floyd Estate preserves more than 250 years of history. The park maintains the historic house cultural landscape and archival collection that includes items pertaining to both the estate and the Seashore.	Refer to response to comment BOEM-2024-0001-0466-0005.

Comment No.	Comment	Response
	Approximately 60 miles away from densely populated New York City lies the Fire Island Wilderness a landscape of wind-swept dunes and dynamic waves. The Fire Island Wilderness has been afforded the highest level of protection by Congress under the Wilderness Act of 1964 (16 U.S.C. 1131 et seq.) in order to preserve its unique and ever-changing ecosystems. In the Fire Island Wilderness forces of nature are allowed to take their course creating a refuge for wildlife and people alike. Interspersed among the federal lands within the Seashore on Fire Island are 17 residential communities that predate the Seashore's authorization. Resort development on Fire Island began as early as 1855 and a number of the island's communities were established prior to the 1930s. The Seashore's enabling legislation includes provisions for private land to be retained and developed if zoning requirements are met. No hard-surfaced roads connect the communities either to each other or to the mainland of Long Island. Communities are accessible mainly by passenger ferry or private boat. Vehicle use is restricted within the boundary of the Seashore. Without paved roads and with limited traffic the communities have retained much of their original character. Some of the communities have hotels or facilities for overnight guests while others are strictly residential. There are approximately 4200 developed properties on Fire Island with approximately 300 residents living on the island year-round. The number of year-round residents has slowly and steadily declined in recent years. Vehicle access is limited for year-round residents contractors and other service providers (telephone fuel garbage etc.) because all vehicles crossing federal lands must have a National Park Service driving permit. The population of Fire Island swells to approximately 30000 during the summer season with a total of two to three million visitors each year. In 2016 recreational visitation to sites and facilities owned or managed by the Seashore was 389075. The primary visitor facilities on Fire Island are the Fire Island Lighthouse Sailors Haven Watch Hill Talisman and the Wilderness Visitor Center. Fire Island Lighthouse is maintained and operated by the Fire Island Lighthouse Preservation Society an NPS cooperating association that offers tours and other visitor programming. Concessioners operate the marina at Sailors	

Comment No.	Comment	Response
	Haven as well as the marina and campground at Watch Hill. The Seashore offers lifeguard- protected swimming areas at Sailors Haven Talisman/Barrett Beach and Watch Hill. Also on Fire Island are ranger stations visitor contact facilities maintenance facilities and several units of park housing. At either end of Fire Island are major state and county beaches that receive sizable visitation and are accessible by vehicle. On Long Island the Seashore's headquarters are in Patchogue and include administrative offices a maintenance facility and a ferry terminal. The William Floyd Estate in Mastic includes the Old Mastic House several outbuildings and structures a cemetery curatorial storage facility preservation and maintenance shop and other natural and cultural resources.	
BOEM-2024-0001-0466-0007	[Bold: Wildlife at Fire Island National Seashore] Habitats within the Fire Island National Seashore are important refuge for a wide variety of migratory and resident birds. A total of 333 avian species have been observed within the Seashore; 67 have been documented to breed within the Seashore (Mitra and Putnam 1999 Trocki 2008). The Seashore is within the Atlantic Flyway a major North American migratory bird route that spans the northern habitats of the Arctic islands coastal Greenland and Canada to as far south as Jamaica and South America (Bird and Nature 2009). The Seashore provides a resting and feeding area for migratory birds traveling this route. Migrating and wintering birds of prey also are inhabitants of Fire Island National Seashore. The northern harrier (*Circus cyaneus*) and American osprey (Pandion haliaetus) may use marsh habitats on the island for nesting while short-eared owls (*Asio flammeus*) long-eared owls (*Asio otus*) and snowy owls (*Nyctea scandiaca*) are occasional winter inhabitants. Other birds of prey using the park may include the red-tailed hawk (*Buteo jamaicensis*) and the bald eagle (Haliaeetus leucocephalus) (Trocki 2008). Fire Island is one of the best-known hawk migration areas on the Eastern seaboard. Peregrine falcons (*Falco peregrinus*) merlins (*Falco coumbarius*) Cooper's hawks (*Accipiter cooperii*) sharpshinned hawks (*Accipiter striatus*) harriers (*Circus spp*.) and short-eared owls (*Asio flammeus*) also winter on Fire Island.	BOEM appreciates the NPS submitting detailed information for Fire Island National Seashore, which is within the birds geographic analysis area. Given that the onshore project components are generally unknown in this programmatic level analysis, BOEM intends to use this detailed information in any future COP-specific NEPA document developed for the NY Bight lease areas, as appropriate.

Comment No.	Comment	Response
BOEM-2024-0001-0466-0008	Nineteen species of marine mammals have been recorded within the boundaries of the Seashore. Identified species include whales porpoises dolphins and seals. The harbor seal (*Phoca vitulina*) is a regular winter visitor at both the Fire Island and Moriches Inlets. Three species of endangered whales have been reported in the waters offshore of Fire Island: fin whale (*Balaenoptera physalus*) humpback whale (*Megaptera novaeangliae*) and northern right whale (*Eubalaena glacialis*) (Trocki 2008).	This information has been incorporated into Section 3.5.6.1.
BOEM-2024-0001-0466-0009	Fire Island National Seashore is used by an array of special-status species including migratory birds butterflies (migratory Monarch Butterflies) and bats including the federally listed Northern Long-Eared Bat [Italics: *Myotis septentrionalis*].	A sentence has been added to Section 3.5.4.1.1 highlighting Fire Island National Seashore.
BOEM-2024-0001-0466-0010	Federal- and state-listed species include the Piping Plover (*Charadrius melodus*) the roseate tern (*Sterna dougallii*) the least tern (*Sterna antillarum*) and the common tern (*Sterna hirundo*). All four are shorebirds that rely on maritime beach and dunes for nesting between March and July. Birds have been found to nest at differing locations from year to year but the Fire Island Wilderness and several of the bay islands appear to be the most popular nesting sites.	Refer to response to comment BOEM-2024-0001-0466-0007.
BOEM-2024-0001-0466-0011	[Bold: Visual Impacts at Fire Island] Visual impact assessments have been done in and around Fire Island for the Empire Wind 1 and 2 Projects. With this DPEIS there is an opportunity to provide a more comprehensive assessment of the cumulative visual impacts from development of the newly leased areas and Empire Wind. NPS recommends the following locations be included as Key Observation Points (KOPs) at the Seashore for this new analysis. Fire Island National Seashore: -Otis Pike Fire Island High Dune Wilderness: views to the southwest from the eastern and western areas of the Wilderness-Watch Hill: view from the ocean overlook-Sailors Haven: view from the ocean overlook-Fire Island Lighthouse Keepers Quarters: view from the Terrace area-Fire Island Lighthouse: view from the top of the lighthouse	Thank you for your comment. Several KOPs were selected for analysis within Fire Island National Seashore. Sailors Haven is approximately 1.4 miles northeast of KOP 37 Point O' Woods, and the Fire Island Lighthouse has two KOPs: KOP-32 Fire Island Lighthouse-top and KOP-33 Fire Island Lighthouse- bottom. Otis Peak High Dune Wilderness and Watch Hill are approximately 8 miles from KOP-37, which can be used as a proxy KOP for these locations. For the COP-level NEPA stage, additional analysis and KOPs will be considered.
BOEM-2024-0001-0466-0012	In regard to the Otis Pike Fire Island High Dune Wilderness protecting "wilderness character" is the bedrock of protecting Wilderness under	Thank you for your comment. The following paragraph has been added to the PEIS *Visual Resources* Section 3.6.9.1.1 *SLIA Affected*

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	the Wilderness Act of 1964 (16 U.S.C. 1131 et seq.). Monitoring and managing wilderness responsibly derives from a framework that uses the five qualities of wilderness character from the legislation: 1. [Underline: Untrammeled]: Wilderness is essentially unhindered and free from modern human control or manipulation.2. [Underline: Natural]: Wilderness maintains ecological systems that are substantially free from the effects of modern civilization.3. [Underline: Undeveloped]: Wilderness retains its primeval character and influence and is essentially without permanent improvements or modern human occupation.4. [Underline: Opportunities for Solitude or Primitive and Unconfined Recreation]: Wilderness provides outstanding opportunities for remoteness from sights and sounds of people and modified areas for self-reliant recreation and freedom from restrictions on visitor behavior.5. [Underline: Other Features of Value]: Wilderness may contain ecological geological or other features of scientific educational scenic or historical value. At Fire Island the night sky looking south from the park's wilderness has always been one of the more stunning and important aspects related to wilderness character and wind turbine generator (WTG) night lighting may have an impact on the Natural Undeveloped Solitude and Other Features wilderness characteristics of the Fire Island wilderness area. Analysis of dark night skies impacts should consider potential impacts under the Wilderness Act. To meet this responsibility and to ensure these unique Wilderness resources are protected necessary information should be gathered for the PEIS to allow NPS to analyze potential impacts to the Wilderness at Fire Island. NPS staff can assist in more detailed discussions on this topic.	*Environment*, to address potential night sky impacts at Fire Island during construction and O&M. Night skies and natural darkness are also components of seascape and landscape character. The numeric Bortel scale measures the night sky's brightness/darkness. Class 1 represents the darkest skies available on Earth, whereas Class 9 is an urban brilliantly lit sky. Dark sky areas along the coast of New England are uncommon because of the dense urban development and associated light domes. However, Fire Island is recognized as being good star-gazing location with Class 4 Bortle rating for "bright suburban" allowing the central galaxy to appear visible only at the zenith and light pollution up to 35° according to the U.S. Light Pollution Map (www.lightpollutionmap.info n.d.). Although Fire Island has decent stargazing as compared to Long Island and New York City, residents need to travel 100 miles the Catskills to experience Class 3 rating and nearly 200 miles to the Adirondacks to experience Class 2 average dark sky. Morristown NHP is the nearest location where the National Park Service (NPS) is collecting data on night skies brightness and Cape Cod National Seashore the nearest collection point with high-quality night sky viewing. (https://www.nps.gov/subjects/nightskies/datacollectionsites.htm) The location of the WTGs at the horizon and their associated, red-colored aviation hazard lighting will generally not be in the direction of stargazing and will not create a light dome like those created by urban area lighting.
BOEM-2024-0001-0466-0013	[Bold: Historic Properties at Fire Island National Seashore] Cultural landscapes that may be impacted at Fire Island include the most prominent of the Seashore's historic structures: the Fire Island Lighthouse and the Keepers Quarters which were completed in 1858 and 1859 respectively. These structures are built on a 15-foot-tall bluestone terrace whose materials were salvaged from the original 1825-1826 lighthouse and keeper's house which was demolished to build the current structures on the site. The extant Lighthouse is a 164-foot conical tower constructed of brick with a hyperbolic curved	Thank you for the information about historic properties present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. BOEM does not intend to identify specific cultural resources through this programmatic evaluation. BOEM Subject Matter Experts will use the information in this comment and subsequent comments provided by the NPS concerning historic properties present at NPS park units to inform COP-level reviews. Developers of individual leases will be required to thoroughly identify cultural resources, and BOEM will assess the

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	profile and a cylindrical shape near its top. The upper portion features a granite cornice and an iron-railed projecting gallery. Since 1891 the tower has been painted with four alternating black and white bands which were kept in the same configuration when the tower was coated in reinforced concrete in 1912. The Keepers Quarters is a two-story rough-coursed granite building whose roof is a combination of a gable and a hip roof. There are 13 historic buildings or structures within two clusters (the Light Station and the Radio Compass Station) on the Light Station tract. Core buildings and structures for the Light Station cluster include the historic Lighthouse Keepers Quarters Terrace and Boat House (1939). Missing from the Light Station cluster are the coal/oil house wharf storehouse and power generation plant. The Radio Compass Station cluster is primarily comprised of the historic Lighthouse Annex Building (1906). This two-story structure with a hip roof (which has been enlarged twice) was originally built as a one-story dwelling. In addition to the Lighthouse Annex Building there are several contributing buildings and structures including the Lighthouse Annex Garage Tool House Oil House Store House the remains of the wireless station's Engine House and Battery House Foundation and several historic buildings and structures within the Radio Officer's residence. Visible concrete foundations and guy wire remnants mark the site of two large radio towers that were demolished in 1937. Another cultural landscape within the boundary of the Seashore is the Carrington Estate located off the Burma Road on federal lands to the west of the residential community of Fire Island Pines. The estate was the property of Broadway producer Frank Carrington who hosted a number of stage screen and literary celebrities during his period of residence and consists of two structures. The main house was constructed in 1909 by Mr. Carrington's father and was sold to the National Park Service by Mr. Carrington in 1969. The adjoining cottage was originally part of a lifesaving station and was moved near the main house in 1947 for use as a guest house. The property was listed on the National Register of Historic Places in 2014. The boardwalk to the beach at the estate provides views of the sea.	impacts of each project on those resources during the COP-level reviews.

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BOEM-2024-0001-0466-0014	[Bold: Overview of Gateway National Recreation Area] Gateway National Recreation Area (Gateway) brings the National Park Service experience to more than nine million visitors each year. As the fourth most visited unit within the National Park System Gateway preserves a mosaic of coastal ecosystems and natural areas interwoven with historic coastal defense and maritime sites in the New York Metropolitan area. Spanning three New York City boroughs and the northernmost portion of the New Jersey shore Gateway's park lands stand in sharp contrast to the nearby metropolitan area and offer abundant opportunities for residents and visitors to recreate and experience nature and historic settings. The Park covers more than 40 square miles in New York and New Jersey with nearly 27000 acres of land and waters under NPS management. Natural areas; water beaches and coastal views; historic coastal defense and maritime structures; diverse recreation opportunities; and educational and interpretive programming combine to create rich and varied visitor experiences at Gateway. Views of the New York Outer Harbor the oldest operating lighthouse in the United States coastal defense resources at Fort Hancock Fort Tilden and Fort Wadsworth public access to bay and ocean shorelines and darkness and night sky are some of the resources that are fundamental to the park's purpose and significance [NPS Gateway National Recreation Area General Management Plan of 2014 (Gateway GMP 2014)]. Unimpeded views are integral to the visitor experience along the park's 31 miles of ocean beaches dunes and water (Gateway GMP 2014).	Refer to response to comment BOEM-2024-0001-0466-0005.
BOEM-2024-0001-0466-0015	The Fort Hancock and Sandy Hook Proving Ground National Historic Landmark District comprises the entirety of the park's Sandy Hook Unit. Fort Hancock and Sandy Hook Proving Ground was designated a National Historic Landmark in December 1982. The district includes the cantonment area of Fort Hancock numerous batteries and the Proving Ground. Sandy Hook is significant in American History as the site of the Federal Reservation that played dual roles in United States Military History. The Sandy Hook Defenses (Fort Hancock) were the key fortification guarding the approaches to New York Harbor through the Nike Era. While the entire District is a fundamental park resource the Endicott/Taft-era batteries Parade Ground (including	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.

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	Officers' Row barracks and cultural landscape) and Nike Missile Launch and Radar Sites are individually identified as fundamental park resources within the Historic District (Gateway GMP 2014). The majority of the coastal fortifications found in the district face the ocean and/or New York Harbor and this association is important. The Sandy Hook Light was individually designated a National Historic Landmark in January 1964. Constructed in 1764 it is the oldest active lighthouse in the United States that is maintained today as an aid to navigation. The 1894 Spermaceti Cove Life Saving Station No. 2 is also located in the park's Sandy Hook Unit. The Life Saving Station was individually listed in the National Register in November 1981. The station which includes a watchtower and boat room was constructed as one of the earliest federally sponsored efforts to save life and property from shipwrecks.	
BOEM-2024-0001-0466-0016	The Fort Tilden Historic District is a fundamental park resource located in the Jamaica Bay Unit on the Rockaway Peninsula. Fort Tilden was listed in the National Register of Historic Places in April 1984 for its significance as a historic Army base commissioned in 1917 as part of the harbor defenses of New York. The original National Register boundary encompassed only the World War I and World War II gun emplacements and associated structures in the fortification area. In 2009 the Keeper of the National Register expanded the boundary to areas administered by the NPS including the fortification post and wharf areas in their entirety under National Register Criterion A for its significance in military history during the period 1916-1967 and is potentially eligible under Criterion D for archeological resources pending further archaeological study. The DOE found that Fort Tilden met Criterion Consideration G to address the Nike Hercules period and Cold War resources that were not yet 50 years old. Battery Harris Battery Kessler Construction Battery 220 and the Nike Missile Launch Site are individually recognized fundamental park resources within the Historic District (Gateway GMP 2014).	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.
BOEM-2024-0001-0466-0017	The Fort Wadsworth Historic District is a fundamental park resource located on the west side of the entrance to New York Harbor in the Staten Island Unit. The Fort Wadsworth Historic District was listed in	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise

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	the National Register in July 2022. The former military reservation was established as part of the New York Harbor coastal defense system and contains 61 contributing resources including 33 buildings 17 structures and 13 sites. Included are a variety of defensive fortifications gun batteries and support structures. Battery Weed Fort Tompkins the Endicott-era batteries and the Torpedo-storage Building are individually identified as fundamental resources in the park's General Management Plan (Gateway GMP 2014). The two most significant fortifications in the district are Battery Weed (formerly Fort Richmond with a related sea wall) and Fort Tompkins both associated with the development of the Third System of American coastal defenses between 1847 and 1876. Each are individually listed in the National Register (Battery Weed in 1972 and Fort Tompkins Quadrangle in 1974).	issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.
BOEM-2024-0001-0466-0018	The Jacob Riis Park Historic District located in the Jamaica Bay Unit on the Rockaway Peninsula is a significant example of a public park constructed between 1932 and 1937 under the Works Progress Administration federal relief program. Contributing resources include a bathing pavilion and two central mall buildings that were described in the original 1977 nomination and nine other buildings described in the 1985 boundary increase of the district. On average more than 400000 visitors each year enjoy ocean views from the mile-long boardwalk and beach.	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.
BOEM-2024-0001-0466-0019	The Far Rockaway Coast Guard Station Historic District located just east of the Fort Tilden Historic District on the Rockaway Peninsula was determined eligible for the National Register of Historic Places by the New York State Historic Preservation Office (NY SHPO) in August 2004. Built between 1938 and 1945 it is significant for its association with the history of lifesaving services and for its distinctive Colonial Revival institutional architecture. The complex is representative of the architecture associated with the formative years of the modern United States Coast Guard.	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.
BOEM-2024-0001-0466-0020	The Breezy Point Surf Club Historic District and the Silver Gull Beach Club ocean front cabana complexes were determined eligible by the NY SHPO in 2012. The Silver Gull Beach Club Historic District is located	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise

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	on the Atlantic Ocean shorefront immediately west of Fort Tilden on the Rockaway Peninsula. The district is an oceanfront cabana complex containing a total of 15 contributing (1 site 7 buildings 7 structures) and 10 noncontributing (5 buildings and 5 structures) resources. The Breezy Point Surf Club is an approximately 60-acre cabana complex containing 69 contributing buildings 11 contributing structures and 1 contributing site; most of these were constructed between 1937 and 1962. Both Historic Districts are located on the Rockaway Peninsula facing the Atlantic Ocean and each retains a high degree of integrity in terms of setting design materials workmanship feeling and association.	issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.
BOEM-2024-0001-0466-0021	The Miller Army Airfield Historic District was listed in the National Register of Historic Places in April 1980. The District totals about 3 acres on Staten Island and includes the double seaplane hangar apron and ramp and the Elm Tree Light. Miller Field was established in 19191921 as a 180-acre army airfield. Hangar No. 38 constructed in 1920 is important because of its association with early aviation history and the history of air coast defenses of New York. The Elm Tree Light an octagonal concrete beacon tower which stands near Hangar No. 38 was constructed by the Coast Guard in 1939 to replace an earlier tower. The significance of the Elm Tree Light lies in its direct association with the early lighthouse service.	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.
BOEM-2024-0001-0466-0022	The beach experience including access to ocean surf public access to bay and ocean shorelines and water-based activities such as surfing boating fishing and swimming are fundamental park resources (Gateway GMP 2014). In 2022 Gateway had more than 8.7 million visitors. Each year more than two million visitors go to the Sandy Hook Unit. Most of these visitors come to the Unit to enjoy the beaches viewsheds and water-based recreation. Riis Beach is a heavily visited recreational area in the park. The beaches of Breezy Point Fort Tilden Plumb Beach and Great Kills are also important areas for park visitors.	Refer to response to comment BOEM-2024-0001-0466-0005.
BOEM-2024-0001-0466-0023	[Bold: Wildlife at Gateway National Recreation Area] The Jamaica Bay and Sandy Hook Units of Gateway National Recreation Area provide important habitat for birds migrating along the North Atlantic Flyway.	BOEM appreciates the NPS submitting detailed information for Gateway National Recreation Area, which is within the birds geographic analysis area. Given that the onshore project

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	Fresh water wetland and maritime forests provide critical foraging habitat and a resting place on the Atlantic migratory flyway. Three hundred twenty-six (326) species of birds including 62 breeding species have been documented using the habitats of the Jamaica Bay Wildlife Refuge (U.S. Fish and Wildlife Service 1997). Research using nano-tags is being conducted by USFWS and Audubon to identify migratory routes of the federally listed piping plover and other shorebirds within the proposed project area. Offshore of Staten Island lie Hoffman and Swinburne Islands which are important habitat for colonial nesting waterbirds wading birds and seabirds. One hundred forty (140) acres of airfield at Floyd Bennett Filed is managed as habitat for grassland birds.	components are generally unknown in this programmatic level analysis, BOEM intends to use this detailed information in any future COP-specific NEPA document developed for the NY Bight lease areas, as appropriate.
BOEM-2024-0001-0466-0024	Migratory bats found at Gateway include little brown myotis (*Myotis lucifugus*) silver-haired bat (*Lasionycteris noctivagans*) red bat (*Lasiurus borealis*) and hoary bat (*Lasiurus cinereus*).	These four bat species are identified as occurring in the bat geographic analysis area (see PEIS Table 3.5.1-1), which includes the Gateway National Recreation Area.
BOEM-2024-0001-0466-0025	Dolphins whales and seals sometimes travel in park-managed waters. Harbor seals are winter visitors to Sandy Hook Great Kills Harbor Hoffman and Swinburne Islands Jamaica Bay and the Rockaway Inlet area and use local docks the jetty at Breezy Point Tip and other locations as haul-out areas. Several marine mammals that use park-managed waters are listed species. These include sei (Balaenoptera borealis) blue (*Balaenoptera musculus*) fin (*Balaenoptera physalus*) humpback (*Megaptera novaeangliae*) and northern right whales (*Eubalaena glacialis*) as well as the state-listed harbor porpoise (*Phocoena phocoena*). All of the whale species are both state- and federally listed as endangered. Humpback whales occasionally feed in New York Bay adjacent to the Rockaway Inlet (USFWS 1997c) and sei humpback and sperm whales (*Physeter macrocephalus*) have been noted swimming in Raritan Bay. The endangered humpback whale occasionally feeds in New York Bay adjacent to the inlet and bottlenose dolphins and endangered sperm whales (*Physeter macrocephalus*) have been noted as strandings in the area.	This information has been incorporated into Section 3.5.6.1.
BOEM-2024-0001-0466-0026	The wildlife group for which the park is best known is birds particularly the waterbirds seabirds shorebirds and waterfowl that frequent its estuarine and coastal shorelines. The park is visited	Refer to response to comment BOEM-2024-0001-0466-0023.

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	annually by 34 species of migratory shorebirds (Harrington pers. comm. n.d.). Jamaica Bay for example averages mid-winter ground counts of birds at about 11000 with a peak (during the years from 1980 to 1992) of 36000 (USFWS 1997b). The migratory and mid-winter concentrations of waterfowl in the Raritan/Sandy Hook Bay complex (which includes both Sandy Hook and the park sites on the shore of Staten Island) average over 60000 birds (USFWS 1997c). Breezy Point and Sandy Hook support some of the highest concentrations of beach-nesting birds in the entire New York Bight coastal region including threatened piping plovers and other rare bird species such as least terns black skimmers and common terns. Other nesting waterbirds at Breezy Point include great black-backed gull herring gull and American oystercatcher. The gulls terns and oystercatchers nesting at these park sites feed throughout Rockaway Inlet and Jamaica Bay. Breezy Point and Sandy Hook are also concentration areas for other migratory shorebirds waterfowl and raptors and other landbirds especially during the summer and fall migrations. The raptor banding station at Breezy Point banded 2414 raptors during the period from 1978 to 1987 and sighted 15715 raptors. The most numerous species sighted were American kestrel (*Falco sparverius*) and sharp-shinned hawk (Accipiter striatus) with a total of 9244 and 4373 birds respectively sighted during that period (USFWS 1997b). Spring hawk counts at Fort Hancock on Sandy Hook average nearly 5000 birds with the same two species dominating (USFWS 1997c). Other species consistently sighted include Cooper's hawk (*Accipiter cooperii*) northern harrier (*Circus cyaneus*) osprey (Pandion haliaetus) peregrine falcon (Falco peregrinus) and merlin (Falco columbarius).	
BOEM-2024-0001-0466-0028	Jamaica Bay's islands because they are somewhat isolated from predation support large numbers of colonial-nesting waterbirds as well as a variety of migratory species. At least 326 species of birds have been sighted at Jamaica Bay on its islands and at the wildlife refuge including confirmed breeding by 62 of those species (USFWS 1997b). A mixed-breed heronry on Canarsie Pol includes a variety of nesting waders including glossy ibis great egret snowy egret cattle egret black-crowned night-heron and tricolored heron. Recent	Refer to response to comment BOEM-2024-0001-0466-0023.

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	information from the New York City Audubon (Phillips pers. comm. 2013) indicates herons and egrets also nest at Elder's Point Subway Island and Little Egg and that breeding at Canarsie Pol has declined from predation by raccoons and human disturbance in recent years. Although no wading birds nested here in recent years Canarsie Pol also has nesting by the state-listed threatened common tern as well as by great black-backed gull herring gull and American oystercatcher. Common terns occur on several other islands in the bay including Jo Co Marsh and Silver Hole Marsh with smaller numbers at Duck Creek Marsh East High Meadow Ruffle Bar and Subway Island. An average of about 1000 common terns and a maximum of 1630 common terns nested on the combined seven colonies in Jamaica Bay between 1984 and 1996 (USFWS 1997b). Laughing gulls (*Larus atricilla*) recolonized Jamaica Bay in 1979; over 99.9 percent of nesting by this species in the state of New York from 1979 to 2007 was associated with the colony at Joco Island in the park. As of 2008 an estimated 1280 nests were active at this site (Washburn Lowney and Gosser 2012). Ospreys also nest in the Jamaica Bay Unit and elsewhere in the Park. Approximately 18 osprey pairs nest in Jamaica Bay 14 pairs at Sandy Hook and 1 pair on Staten Island. Clapper rails (*Rallus longirostris*) and common moorhens (*Gallinula chloropus*) nest in the saltmarshes. American oystercatchers nest at several islands in Jamaica Bay; they also have nested along the airport shoreline. A variety of other birds breed on the islands and uplands in the bay including one of only two New York State sites for and the northernmost nesting extent of the boat-tailed grackle (*Quiscalus major*). Shorebirds known to breed in or around Jamaica Bay include killdeer (*Charadrius vociferus*) American oystercatcher willet spotted sandpiper (*Actitis macularia*) upland sandpiper and American woodcock (*Scolopax minor*). In addition to providing wintering and nesting habitat Jamaica Bay is one of the most important migratory shorebird stopover sites in the New York Bight region especially during fall migration (July to November). The shorebirds use much of the bay during the migration stopovers but tend to focus on the intertidal areas during low tide and move to East and West Ponds on Ruler's Bar Hassock during higher tides. The water in East Pond is artificially lowered after July 1 each year. From	

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	1981 to 1990 there was an average of 27 and a maximum of 36 shorebird species counted at the East and West Ponds in the Jamaica Bay Wildlife Refuge during the fall. The most abundant shorebirds during that period were black-bellied plover (*Pluvialis squatarola*) semipalmated plover (*Charadrius semipalmatus*) greater yellowlegs (*Tringa melanoleuca*) ruddy turnstone (*Arenaria interpres*) sanderling (*Calidris alba*) semipalmated sandpiper (*Calidris pusilla*) least sandpiper (*Calidris minutilla*) dunlin (*Calidris alpina*) and short-billed dowitcher (*Limnodromus griseus*). Jamaica Bay is also important during spring migration (March to June) on the ponds for several of these same species as well as red knot (*Calidris canutus*). Hunting is prohibited in the park by virtue of its New York City location which may contribute to the high numbers of individual ducks and duck species. In one year-round survey of birds at Jamaica Bay 263000 individuals of 32 species were recorded (USFWS 1997b).	
BOEM-2024-0001-0466-0029	The combination of geographic location and configuration coupled with productive bay wetlands flats and waters in Raritan and Sandy Hook Bays make this another important migratory staging area in the park for many species of waterfowl on the Atlantic Flyway. Peak migration occurs in late October but November aerial counts in New Jersey waters still average nearly 45000 birds (USFWS 1997c). The number of horned grebes (*Podiceps auritus*) as well as common and red-throated loons (*Gavia immer G. stellata*) during migration is regionally significant. Especially notable are the overwintering scaup concentrations primarily greater scaup which have increased in this area recently and are an important component of the Atlantic Flyway population. Other significant species populations include Canada geese in the Raritan River and the Navesink system American black ducks canvasbacks (*Aythya valisineria*) mallards (Anas platyrhynchos) and brant along with lesser numbers of bufflehead oldsquaw (*Clangula hyemalis*) mergansers (primarily red-breasted mergansers [*Mergus serrator*]) common goldeneye (*Bucephala clangula*) and American wigeons (*Anas americana*). These waterfowl are not evenly distributed but rather tend to concentrate along the southern Raritan Bay and Staten Island shorelines where moderate-sized flocks of scaup and American black ducks and smaller groups of brant occur.	Refer to response to comment BOEM-2024-0001-0466-0023.

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	Shrublands and woodlands can offer important feeding or resting habitat for songbirds (or "passerines") in the park such as sparrows warblers and other perching species. As noted above grasslands at Fort Hancock on Sandy Hook and open areas at Breezy Point support very large spring raptor migrations as well.	
BOEM-2024-0001-0466-0030	Grasslands at Floyd Bennett Field became habitat for certain open-country bird species after the airfield was decommissioned in 1950 and stayed that way until the last few decades when open areas began to transition into shrub and forest. In 1985 a portion of Floyd Bennett Field was cleared and mowed to create grasslands; about 140 acres are still maintained using these techniques. This area is unique in that it is a large grassland in the urban area of New York City supporting feeding and resting grassland species that are not seen elsewhere in the city. In addition several birds have or now use this habitat for nesting including grasshopper sparrow (*Ammodramus savannarum*) horned lark (*Eremophila alpestris*) eastern meadowlark (Sturnella magna) upland sandpiper savannah sparrow (*Passerculus sandwichensis)* northern harrier American kestrel and common barn owl (*Tyto alba*). Use of this area by grasshopper sparrows (a state-listed species) increased significantly in average abundance between 1984 and 1992.Since 1996 however there have been no grasshopper sparrows nesting at Floyd Bennett Field. Overwintering grassland birds at Floyd Bennett Field include northern harrier roughlegged hawk (Buteo lagopus) American kestrel common barn owl short-eared owl (*Asio flammeus*) horned lark eastern meadowlark and savannah sparrow. The bobolink (*Dolichonyx oryzivorus*) is a regular migrant visitor in the grasslands. Grassland birds especially upland sandpipers also use the grassland habitat along the runways at John F. Kennedy International Airport (USFWS 1997b). The combination of geographic location and configuration coupled with productive bay wetlands flats and waters in Raritan and Sandy Hook Bays make this another important migratory staging area in the park for many species of waterfowl on the Atlantic Flyway.	Refer to response to comment BOEM-2024-0001-0466-0023.
BOEM-2024-0001-0466-0031	[Bold: Visual Impacts at Gateway] The Gateway General Management Plan (GMP) of 2014 identifies views of the New York Harbor as a	Thank you for your comment. Five KOPs within the Gateway National Recreation Area were studied in the PEIS: KOP-26 Fort

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	fundamental park resource. The PEIS should evaluate the maximum cumulative impacts of the new leasing areas and the Empire Wind Projects on the uninterrupted sea view from the seven ocean-front historic districts and 31 miles of ocean beaches dunes and water. NPS recommends the following locations be included as Key Observation Points (KOPs). Gateway National Recreation Area: -Sandy Hook Light: View from the top of the lighthouse looking southeast.-Sandy Hook beaches: View from B beach cross-over looking southeast.-Sandy Hook Observation Deck at Lot M: View from top of observation deck looking southeast.-Riis Park boardwalk: View from boardwalk in front of bathhouse looking southeast.-Battery Harris Fort Tilden: View from viewing platform looking southeast.-Fort Wadsworth: View from overlook looking southeast. NPS staff can assist in providing access to these areas.	Tilden/Jacob Riis Park (nighttime simulation available here: https://www.boem.gov/renewable-energy/state-activities/new-york-bight), KOP-21 Great Kills, KOP-22 Roosevelt Pier, KOP-20 Sand Hook Beach, and KOP-34 Sandy Hook Observatory. It was determined that the NY Bight projects were not visible from the Staten Island Unit of the Gateway National Recreation Area; therefore, these KOPs were not included in the EIS analysis. The turbine blade tips of OCS-A 0544 are potentially visible from the Jamaica Bay Unit and the Sandy Hook Unit. KOP-20 Sandy Hook Beach and KOP-34 Sandy Hook Observatory were removed from the study because the project team was denied access to the outside viewing of the Sandy Hook Lighthouse to collect data and photography due to safety concerns. GIS viewshed analysis also determined that the NY Bight projects would have extremely low visibility from Sandy Hook. However, there are comparable views from other KOPs that were included in the analysis. Views from Sandy Hook Beach B (approximately 43.0 miles from OCS-A 0544) can be compared to KOP-19 Navasink Twin Lights Base and KOP-35 Twin Lights Light House, which, although 0.5 mile inland, has a 203-foot elevated view, creating similar viewing conditions with earth curvature. A visual simulation was created for KOP-35. The Gateway National Recreation Area does fall into cumulative impacts from the Empire Wind lease area OCS-A 0512, and KOP-26 Fort Tilden and KOP-35 Twin Lights Lighthouse are both analyzed for maximum cumulative impacts. For the COP-level NEPA stage, additional analysis and KOPs will be considered.
BOEM-2024-0001-0466-0032	[Bold: Historic Properties at Gateway National Recreation Area]Gateway possesses more than 800 historic buildings structures landscapes and archeological sites with hundreds of additional individual features that contribute to the character of these special places. Structures dedicated to ship navigation and lifesaving are well represented in the maritime cultural record of the area. The Sandy Hook Light a National Historic Landmark was first illuminated on June 11 1764 generated by 48 oil-fueled lamps. Today it is the oldest operating lighthouse in the United States and the only surviving one of the eleven lighthouse buildings dating to the colonial period. The	Thank you for the information about historic resources present at NPS park units. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.

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	Elm Tree Light a contributing structure at Miller Army Airfield Historic District has undergone several transformations. The current Elm Tree Light was constructed by the U.S. Coast Guard in 1939 to replace an earlier tower that had served as a mark for sailing vessels in the late 18th century (Wren 1974; NPS 1979a). The first Fort Tompkins lighthouse was replaced in 1893 with a new light constructed on the top of Battery Weed to provide better protection of the shipping lane through the Narrows. The light was visible for 14 nautical miles. The light was decommissioned in 1965 (Olmsted Center for Landscape Preservation 2008). By the 19th century lifesaving stations were being constructed across the harbor area that would prove crucial for saving shipwreck victims. The extant Spermaceti Cove Life Saving Station (1894) was identified as Station No. 2 at the Sandy Hook Unit. The station was decommissioned in 1949 as an active U.S. Coast Guard Station. Additional lifesaving stations built in 1848 1855 1872 and 1891 on Sandy Hook no longer exist. The Far Rockaway Coast Guard Station complex served as an important lifesaving site for the numerous marine accidents and shipwrecks on the Rockaway Peninsula during the 19th and early 20th centuries. Seacoast fortifications along the New York Harbor area date to the early days of discovery and colonization of the New Jersey and New York coastlines. Since the Colonial period the defense of New York Harbor was considered critical for commerce and the defense of the United States. The fortifications included a variety of forts and batteries dating back to the late 18th century and continuing through the Cold War era. Technological advances in weaponry and construction techniques through time resulted in greatly improved fortifications some of which were built over earlier outdated structures. Both commercial and military aviation were quickly evolving after World War I. The early history of aviation in the United States is well represented in several Gateway facilities dating back to the early 20th century including Floyd Bennett Field Miller Army Airfield and the Rockaway Naval Air Station (now the site of Jacob Riis Park).	
BOEM-2024-0001-0466-0033	[Bold: Benthic Environment] Both Fire Island and Gateway have jurisdiction over activities occurring along the coastline and in their respective jurisdictional marine waters. NPS is responsible for the	Thank you for your comment. More detailed benthic mapping and descriptions would be addressed in project-specific COPs and

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	protection of resources in its jurisdictional waters including but not limited to biologic geologic historic and cultural resources. Of note the coastal and marine areas of both parks have known and unknown submerged archaeological resources related to historic activities and events of importance to area Federal Indian Tribes. From an ecological perspective the benthic environments within these coastal and marine jurisdictional areas include a variety of resources of concern to the NPS including physical benthic habitat characteristics as well as the biotic communities associated with them (e.g. aquatic vegetation and fauna living in and depending on these habitats) all of which affect and are affected by the water column. Limited information is available for the submerged benthic habitats; however seafloor habitat mapping projects were completed for both Fire Island National Seashore and the Sandy Hook unit of Gateway in response to Hurricane Sandy. Offshore wind development can impact benthic ecosystems in a variety of ways depending on the location and development phase. In addition to direct impacts such development may result in indirect impacts associated with artificial reef effects seafloor disturbance and the introduction of energy emissions (e.g. noise vibrations and electromagnetic fields) that could have long- term impacts on benthic ecosystem structure and function. Reports associated with the Empire Wind Projects include data such as bottom surface features sediment characteristics and vegetative and macrofaunal species distributions descriptions and management interest; results of these reports and other local benthic analyses including cumulative impacts to seagrass beds (and suitable habitat as indicated by historical seagrass distribution) and other declining benthic resources should be considered as part of the analysis of potential impacts to the benthic environment. If construction or operation activities would occur in or near the marine and coastal environments of Fire Island or Gateway additional collaboration would be required to ensure those activities do not disturb any sensitive park benthic resources. The NOI does not address the issue of potential landfall locations for power cables from the newly leased areas. This would seem to be a topic that should be addressed in the PEIS.	would include potential export cables and landfall locations for each of the lease areas.

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BOEM-2024-0001-0466-0034	[Bold: Marine Life Birds and Bats] A synopsis of wildlife resources of concern to the Parks is provided below and more detailed park-specific information is available for many resources. We request this information be considered in more detailed analyses and discussions with applicable agencies such as the U.S. Fish and Wildlife Service (USFWS) National Oceanic and Atmospheric Administration (NOAA) and its National Marine Fisheries Service (NMFS) regarding appropriate AMMM measures to avoid adverse impacts to these species. The New York State Energy Research and Development Authority (NYSERDA) State of the Science Workshops on Wildlife and Offshore Wind Energy reports also provide a good summary of questions related to potential offshore wind impacts to some of these resources of concern to the NPS and other groups (e.g. benthic habitat fish and invertebrates sea turtles marine mammals bats and birds). These resources could be affected by a range of stressors and environmental changes associated with various stages of project development (e.g. pre-construction construction operation decommissioning). We look forward to being able to review and comment in the future when more detailed information and analyses are provided in the PEIS. Overall as the marine environment is built out by the newly leased offshore wind project areas in the NY Bight as well as by the Empire Wind Projects the potential cumulative impacts to marine mammals and sea turtles will be of significant importance. The PEIS should serve to highlight these potential impacts and the AMMM measures that could be applied across the NY Bight. Many of the potentially affected species do not occur in areas where utility-scale offshore wind exists today (e.g. Europe) and so there is no parallel data from which to draw conclusions. Due to U.S. Coast Guard regulations the bases of the turbines will be lit and could become an attractant that alters current navigation patterns. Similarly the turbines may disrupt the marine acoustic environment for acoustic sensitive species such as whales which in turn may inhibit communication or change patterns of behavior; little is known about the potential impacts of other potential disruptions to the marine environment such as vibrations and electromagnetic fields associated with wind turbines and cables. These animals are already	AMMM measure BB-3 includes monitoring the potential impacts on birds and bats through the life of the New York Bight projects. More detailed and project-specific AMMM measures could be evaluated at the project-specific COP NEPA review stage to further address potential project-specific impacts on biological resources, including birds and bats.

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	experiencing changes in migratory patterns related to climate change (e.g. changes in water temperatures and food source availability) which have potentially led to stranding and cold stunning events occurring more regularly in the Atlantic and an expansion of turtle nesting north of previously recognized nesting sites. The NPS defers to USFWS NOAA and its NMFS for their expert opinions regarding permitting under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq.) Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 et seq.) and related laws and regulations. The NPS nonetheless has jurisdiction over those animals that occur within its boundaries and to the degree possible protects those individuals and populations. As such NPS has a strong interest in potential disruptions to those individuals and populations that frequent the Parks and recommends that the relevant agencies develop monitoring plans as a subset of the AMMM measures so that all can benefit from scientific data in this emerging area of study.	
BOEM-2024-0001-0466-0035	[Bold: Night Skies]Protecting the night sky is a critical role NPS pursues at Fire Island National Seashore and Gateway National Recreation Area. Despite the presence of the New York and New Jersey metropolitan areas both Parks provide some of the darkest nighttime skies available to visitors and residents alike and night skies are identified as a fundamental resource in the Gateway GMP of 2014. Night skies are an important resource for Fire Island Gateway and NHLs such as the lighthouses affecting aspects such as biological and cultural properties the wilderness and historic setting and the visitor experience and enjoyment. The opportunity to enjoy starry night skies and other nocturnal phenomenon as well as landscape features of the park under natural light from the night sky is an integral part of an overall visitor experience. Night skies are one of the many resources protected under the National Park Service Organic Act. The important role that natural cycles of light and dark play in natural resource processes and the evolution of species is well established and therefore the NPS protects natural darkness and other components of natural lightscapes in parks by minimizing light from park facilities and by educating and working cooperatively with	See response to comment BOEM-2024-0001-0466-0012.

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	neighboring communities local governments and the public to minimize the use of outdoor lighting wherever possible considering public safety and other park management objectives. NPS night skies and natural sounds experts can assist BOEM in addressing these topics in the PEIS.	
BOEM-2024-0001-0466-0036	NPS recommends the following potential AMMM measures: -Projects should be required where possible to implement an Aircraft Detection Lighting System (ADLS; or a similar system) to turn the aviation obstruction lights on and off in response to detection of nearby aircraft.-ADLS efficacy analysis should be conducted so that the impact from the aviation warning lights can be quantified for the cases with and without ADLS.-Security lighting should be directed downward and shielded. Some lights could have motion sensors added.-Lighting principles: a. Control -- lights should be off when not needed. This applies to both construction and operations phases. b. Brightness the minimum lumen output needed should be used c. Warm color-temperature light -- use amber lights when possible instead of white light.-Lighting plans for both construction and operations should be required in project specific EISs.-Visual simulations should be required using both static images and light-flashing animation at night from multiple KOPs for offshore wind projects as they are developed.	AMMM measure MUL-37 requires lessees to use ADLS. Additionally, AMMM measure VIS-7 addresses ADLS efficacy through monitoring the frequency that ADLS is operative during the project's operations. Lessees are required to implement BOEM lighting and marking guidelines, and U.S. Coast Guard (USCG) and FAA lighting and marking requirements. Project-specific lighting will be analyzed during COP NEPA reviews. The visual simulations necessary for COP NEPA review are decided on a project-by-project basis depending on if the project is concealed below the visible horizon.
BOEM-2024-0001-0466-0037	[Bold: Visual Impacts to NHLs] There are numerous NHLs in the New York and New Jersey area that could be visually impacted by the wind turbine generators and/or by offshore substations or by onshore infrastructure as the new lease areas and Empire Wind 1 and 2 are developed. We recommend the following NHLs be included in the PEIS including the assessment of potential visual impacts. -Empire State Building NHL: View from iconic Observation Deck on 86th floor with sweeping 360-degree views on Manhattan including NY Harbor.-Green-Wood Cemetery NHL: Located on the highest elevation in Brooklyn-Twin Lights Historic Site NHL: Highlands NJ 246 above sea level on the headlands of Navesink Highlands and directly overlooking Sandy Hook Bay the entrance to New York Harbor	Thank you for your comment. KOP-19 Navasink Twin Lights Base, KOP-35 Twin Lights Light House, and KOP-39 Empire State Building Observation Deck were all evaluated as part of the PEIS. Both KOP-35 and KOP-39 are included in the cumulative impact evaluation. For the COP-level NEPA stage, additional analysis and KOPs will be considered.

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BOEM-2024-0001-0466-0038	[Bold: Overview of Area National Historic Landmarks and the NY Bight PDEIS]National Historic Landmarks are historic properties that illustrate the heritage of the United States. The NPS has specific responsibilities with regards to administration of the NHL Program. The over 2600 NHLs found in the U.S. today come in many forms: historic buildings sites structures objects and districts. Each NHL represents an outstanding aspect of American history and culture. Of note federal funding or licensing of activities that affect historic properties are regulated principally by Section 106 and Section 110(f) of the NHPA. Other federal effects are listed in 36 CFR 65.2. Under Sections 106 and 110(f) of the Act federal agencies must "take into account" the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking and its effects. Implementing regulations of the ACHP may be found in 36 CFR 800 "Protection of Historic Properties" which establishes a process of consultation with the SHPO and the ACHP leading in most instances to agreement on how the undertaking will proceed. Steps in the process include identification and evaluation of historic properties that may be affected assessment of the effects of the federal action and resolution of any adverse effects that would occur. If a federal activity will "directly and adversely affect" a Landmark Section 110(f) of the Act also calls for federal agencies to undertake "such planning and actions as may be necessary to minimize harm to such Landmark." As with Section 106 the agency must provide the Advisory Council with a reasonable opportunity to comment.	Thank you for the information about the NHL program. BOEM has complied and will continue to comply with all requirements under Section 106 and 110(f) regarding NHLs. The commenter does not pose a question or raise issues with the environmental analysis. See response to comment BOEM-2024-0001-0466-0013 above.

P.4.1.2 U.S. Fish and Wildlife Service

Table P.4-3. Responses to Comments from the U.S. Fish and Wildlife Service (BOEM-2024-0001-0400)

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BOEM-2024-0001-0400-0001	BOEM is preparing a Programmatic Biological Assessment (BA) that the Service will review pursuant to Section 7(a)(2) of the ESA. The Service has been consulting with BOEM regarding the BA which (among others) includes the six New York Bight lease areas. The Service will continue coordinating with BOEM as additional information is received. Impact determinations to federally listed species that the Service has jurisdiction over should not be included within future NEPA documentation without concurrence from the Service or an explanation that BOEM is still seeking our concurrence.	On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, and the PEIS has been edited to reflect this.
BOEM-2024-0001-0400-0002	The Service continues to maintain the position that insufficient evidence exists to demonstrate that the wider spacing of offshore wind turbines and intermittence/patchiness of projects will result in negligible impacts to bats. We also continue to maintain the position that there is currently a large amount of uncertainty regarding bat activity in offshore environments during any climatic conditions that overall makes it difficult to support the conclusion of negligible impacts reached in Chapter 3.5.1 of the DPEIS. BOEM continues to state that the cumulative impacts of the no action alternative (which considers other offshore wind projects) would be negligible to bats. However due to the reasons stated throughout Service comments on the preliminary Draft PEIS and our continuing comments in Enclosure A the Service continues to disagree with negligible impact determinations. Additionally it is unclear why the cumulative impacts of the no action alternative (which considers the construction of 2252 wind turbine generators and associated structures with planned offshore wind projects) was explained to have negligible impacts to bats but the impacts of the proposed New York Bight alternatives are expected to have negligible to minor impacts to bats. The Service recommends that all impact determinations to bats are listed as minor or greater.	BOEM acknowledges that there is no study that looked at offshore wind turbine spacing and bat migration. However, unless new information becomes available on this matter, BOEM maintains that this is a reasonable hypothesis: that wider spacing of offshore wind turbines and intermittence/patchiness of projects will result in negligible impacts on bats. But more importantly, the literature, studies, and offshore bat surveys documented and described in PEIS Section 3.5.1, *Bats,* show that bat presence in the offshore environment is low and represents a very small percentage of total populations onshore. As such, BOEM anticipates the risk to bats from any offshore IPF is low (regardless of weather conditions). Therefore, BOEM maintains the negligible determination for potential impacts on bats in the offshore environment. Regarding the "negligible" impact determination for cumulative impacts under the No Action Alternative – the impact determination should have been "negligible to minor." The negligible determination is more applicable to impacts in the offshore environment (see paragraph above) while the minor impact determination is applicable to the onshore environment where there is more uncertainty on project locations and amount/quality of habitat removal. This is the same reasoning for both Alternatives B and C, and should also have been included

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		under cumulative impacts for the No Action Alternative. The PEIS has been revised to include "minor" for cumulative impacts under the No Action Alternative.
BOEM-2024-0001-0400-0003	The Service continues to recommend that disclaimers of information gaps are clearly articulated throughout the birds section (Chapter 3.5.3) of the DPEIS. Also due to the reasons previously stated in our preliminary DPEIS review letter and our additional comments from the Service's Migratory Birds Team in Enclosure A the Service continues to disagree with BOEM's "moderate beneficial impacts" determination. As such we continue to recommend that this determination is removed from the DPEIS.	Regarding data gaps, BOEM cites original works in Section 3.5.3, and those works disclose the data gaps and uncertainties that may exist. Identifying every data gap or uncertainty throughout the resource section would be redundant and affect flow of writing/reading; and would pose issues regarding page length, which is already constrained due to NEPA regulatory requirements (40 CFR 1502.7 *Page Limits*). BOEM also notes that the PEIS does not ignore uncertainties and data gaps, as there is an entire PEIS appendix (Appendix E, *Analysis of Incomplete and Unavailable Information*) that addresses incomplete and unavailable information for every resource analyzed in the PEIS, as required by NEPA regulations. In accordance with 40 CFR 1502.21, when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS and when information is incomplete or unavailable, the agency must make clear that such information is lacking; BOEM has done so in PEIS Appendix E, and the discussion for birds is in Section E.1.5, *Birds*. As BOEM states in Section E.1.5, there will always be some level of incomplete information on the distribution and habitat use of birds in the offshore portions of the geographic analysis area, as well as for the potential for collision risk and avoidance behaviors for some of the bird species. However, BOEM concludes the PEIS is sufficient to support sound scientific judgments and informed decision-making related to bird distribution and use of the offshore portions of the geographic analysis area as well as to the potential for collision risk and avoidance behaviors, and does not believe that there is incomplete or unavailable information on birds that is essential to making a reasoned choice among alternatives. Furthermore, BOEM continues to collect information on bird presence in the offshore environment to help inform the assessment of potential impacts on birds from construction and operation of offshore wind farms. In addition, COP-specific NEPA documents for NY Bight lease areas that might be developed in

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		the future would include project-specific bird information based on the most current and relevant bird information available at that time. Regarding the “moderate beneficial” impact determination, to ensure a complete analysis of the presence of structures IPF, BOEM is retaining the beneficial effects discussion and determination of “moderate beneficial” related to derelict fishing gear and the creation of habitat for structure-oriented or hard-bottom species (typically referred to as “reef effect”). These beneficial effects have been observed and are documented with citations in the PEIS. BOEM understands that there could be a potential relationship between bird attraction to these areas and adverse effects related to interactions with WTGs (e.g., collisions), which is why BOEM included statements of this related risk immediately after the discussion of the beneficial effects (see PEIS page 3.5.3-17, where BOEM states “*Conversely, increased foraging opportunities could attract marine birds, potentially exposing those individuals to increased collision risk associated with operating WTGs*” and “*In contrast, the presence of structures may also increase recreational fishing and, thus, expose individual birds to harm from fishing line and hooks*”). Therefore, BOEM discloses the full potential impact and believes it is reasonable to state that there could be potential beneficial effects on birds because it is possible that a bird could be attracted to these areas near WTGs to utilize the habitat and never collide with any part of the structure.
BOEM-2024-0001-0400-0004	USFWS Draft Programmatic Environmental Impact Statement Comments: The Service continues to support our position that there is not enough evidence to support that the wider spacing of offshore wind turbines and intermittence/patchiness of projects will result in negligible impacts to bats. The Madsen et al. (2012) study that was added in to support BOEM's position is about bird movement not bats. Given the biological differences between birds and bats the study does not appear applicable to analyzing impacts to bats. Additionally the Madsen et al. (2012) study analyzed movements of common eider (Somateria mollissima) in the Western Baltic Sea	Refer to response to comment BOEM-2024-0001-0400-0002.

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	located south of Denmark. While the information from Madsen et al. (2012) is potentially useful for heavy-bodied waterfowl it inadequately (or does not at all for bats) addresses behavioral responses of other species within the proposed lease areas. Due to the lack of evidence the Service recommends that BOEM removes their assumptions that wider spacing and intermittence of projects will result in negligible impacts to bats. The Service recommends that BOEM explains that there is currently not enough information to determine how spacing and intermittence of projects will impact bats (e.g. likelihood of collision or injury rates increased usage of energy expenditures etc.) and edits the remaining portions of the Draft PEIS as necessary to reflect that.	
BOEM-2024-0001-0400-0005	USFWS Draft Programmatic Environmental Impact Statement Comments: The Service appreciates the inclusion of potential impacts to bats due to roosting on wind turbine generators. However the Service continues to support the position that there is currently a large amount of uncertainty regarding bat activity in offshore environments during any climatic conditions that overall makes it difficult to support the conclusion of negligible impacts reached in this section of the Draft PEIS. As previously explained if bats were to experience adverse conditions over the ocean barring returning to land there are likely no suitable locations for them to roost or to wait out the weather. It is not clear how BOEM is suggesting that bats will reduce their activity offshore during these conditions. If the bats reduce their activities during adverse weather conditions and attempt to roost on the wind turbine generators they may collide with the blades and be injured or die. It is unclear how this is supportive of BOEM's position that there will be negligible impact to bats. If there is evidence to support that bats migrating in offshore environments fly to terrestrial environments to reduce their activities during adverse climatic conditions that would be helpful to include in BOEM's analysis. The Service recommends that BOEM provides clarity on how bats flying over the proposed offshore wind areas will reduce their activity during adverse climatic conditions. This should include an explanation as to whether bats are expected to fly towards terrestrial	Impacts on bats in the offshore environment should be viewed in the context of bat presence in the offshore environment. Based on best-available information, including literature, studies, and offshore bat surveys documented and described in PEIS Section 3.5.1, bat presence in the offshore environment is low and represents a very small percentage of total populations onshore. As such, BOEM anticipates the risk to bat species from offshore IPFs is low (regardless of weather conditions). Regarding adverse weather conditions, the PEIS is simply stating that bats are found in lower numbers when winds are higher, temperatures are colder, and during rain (including in the offshore environment), which is based on the cited literature (Arnett et al. 2008; Erickson et al. 2002; Sjollema et al. 2014; Dominion Energy 2022). In a scenario where a bat along the coastline intended on migrating out from the coastline to offshore waters, any high winds, cooler temperatures, and rain along the near coastal area would likely deter the bat from migrating offshore, thus avoiding exposure to turbines should turbines be present in the intended migration path. If a bat is already migrating far offshore and encounters weather conditions that include higher winds, lower temperatures, and rain, it is unknown what that bat would do. They tend to avoid these climatic conditions, so they could attempt to fly back to shore or look for a structure to seek shelter and rest (e.g., buoy, ship). Ultimately, the fate of a bat cannot be

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	environments and seek shelter rest on the proposed offshore wind structures (which could increase collision risk) fly away from those conditions or do something else. If there is no evidence to support what bats flying over the ocean will do during adverse climatic conditions BOEM should explain that uncertainty within the PEIS and analyze the possibility of those conditions being adverse to bats.	predicted in this situation because it depends on the location offshore where the climatic conditions are encountered, how far the individual is from shore, and the type of structure they might land on, if a structure is even present. If the structure is a wind turbine, then the bat would be at risk because, as documented in PEIS Section 3.5.1.3.3, bats have been found to use offshore structures to provide shelter from adverse weather or to rest after a long flight (see Solick and Newman 2021), and have been found to roost in the nacelles of turbines, albeit closer to shore than the locations considered in the PEIS (see Ahlen et al. 2009). However, because bat presence in the offshore environment is low and represents a very small percentage of populations onshore, the risk would be low and no population effects would be anticipated. BOEM will continue to collect information on bat presence in the offshore environment to help inform the assessment of potential impacts on bats from construction and operation of offshore wind farms.
BOEM-2024-0001-0400-0006	USFWS Draft Programmatic Environmental Impact Statement Comments: The Service appreciates the inclusion of the bird and bat post- construction monitoring plan in BB-3. BOEM continues to state that the cumulative impacts of the no action alternative (which considers other offshore wind projects) would be negligible to bats. However due to the reasons stated throughout Service comments on the preliminary Draft PEIS and our continuing comments above the Service continues to disagree with negligible impact determinations. Additionally it is unclear why the cumulative impacts of the no action alternative (which considers the construction of 2252 wind turbine generators and associated structures with planned offshore wind projects) was explained to have negligible impacts to bats but the impacts of the proposed New York Bight alternatives are expected to have negligible to minor impacts to bats. The Service recommends that all impact determinations to bats are listed as minor or greater.	Refer to response to comment BOEM-2024-0001-0400-0002.
BOEM-2024-0001-0400-0007	USFWS Draft Programmatic Environmental Impact Statement Comments: For BB-1: We recommend the usage of the Injury and	BOEM has revised BB-1 to include usage of the IMR system for reporting.

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	Mortality Reporting (IMR) System to report all occurrences of all species of bird and bat carcasses.	
BOEM-2024-0001-0400-0008	USFWS Draft Programmatic Environmental Impact Statement Comments: The Service continues to recommend that disclaimers of information gaps are clearly articulated throughout the birds section of the Draft PEIS. For example BOEM is still stating the following in Chapter 3.5.3.3.3 that we expressed concerns about in our original comment: "Generally only a small percentage of a species' seasonal population would potentially encounter operating WTGs during annual migration Table 3.5.3-1)." We appreciate the inclusion to note that the data is referring to seabird populations but that is not clear while reading that sentence. The Service recommends adding in the following sentence (or something like it) after the sentence of concern mentioned above "However the 47 species listed in Table 3.5.3-1 do not account for the songbirds shorebirds raptors and other species that are known to migrate across the Atlantic Outer Continental Shelf. Particularly this likely excludes species that migrate nocturnally and that have not been detected during boat-based or aerial surveys. Additional studies are required to fill in these data gaps."	Refer to response to comment BOEM-2024-0001-0400-0003 regarding articulating data gaps throughout the PEIS bird section. In response to previous USFWS comments, BOEM clarified in the PEIS that Table 3.5.3-1 is specific to seabirds (including the title of the table). As stated in PEIS Table 3.5.3-2, other non-sea birds, such as songbirds, almost exclusively use terrestrial, freshwater, and coastal habitats and do not use the offshore marine system except during migration. Further, the PEIS states that within the Atlantic Flyway, much of the bird activity is concentrated along the coastline (Watts 2010). Waterbirds use a corridor between the coast and several kilometers out onto the OCS, whereas land birds tend to use a wider corridor extending from the coastline to tens of kilometers inland (Watts 2010). Although both groups may occur over land or water within the flyway and may extend considerable distances from shore, the highest diversity and density are centered on the shoreline. Overall, and as described in the PEIS, current information indicates an overall low abundance of all bird types on the OCS, with much higher abundances along the nearshore areas of the coastline.
BOEM-2024-0001-0400-0009	USFWS Draft Programmatic Environmental Impact Statement Comments: The Service continues to support our position that BOEM elaborates on this section to clarify the claim that multiple course corrections or an altered route for avoidance will not result in significant effects. As previously mentioned it does not appear that this subject has been studied enough to support BOEM's statement. Additional Comments from Region 5 Migratory Birds Team: Even if it is the best available science it is still insufficient for making definitive statements about the broader community such as the last two sentences: "As such adverse impacts of additional energy expenditure due to minor course corrections or complete avoidance of the lease areas would not be expected to be biologically significant. Any additional flight distances would likely be small for most migrating birds when compared with the overall distances traveled and no	Refer to response to comment BOEM-2024-0001-0400-0003 regarding articulating data gaps throughout the PEIS bird section.

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	individual fitness or population-level effects would be anticipated." As suggested in the original comment these statements should be reworded to better reflect that lack of data and thus uncertainty related to the subject.	
BOEM-2024-0001-0400-0010	USFWS Draft Programmatic Environmental Impact Statement Comments: The Service appreciates the inclusion of AMMM Measure BB-3. However the Service continues to support our recommendation that a disclaimer is included as mentioned in our original comment.	Refer to response to comment BOEM-2024-0001-0400-0003 for a discussion on data gaps, uncertainties, and incomplete and unavailable information. BOEM notes that BB-3 is an AMMM measure that has been previously applied on other offshore wind approvals and has been updated to align with the most current agreed-upon language with USFWS.
BOEM-2024-0001-0400-0011	Section #: 3.5.3 USFWS Draft Programmatic Environmental Impact Statement Comments: Due to reasons previously stated and our additional comments from the Migratory Birds Team below the Service continues to disagree with BOEM's "moderate beneficial impacts" determination. As such we continue to recommend that it is removed from the Draft PEIS.	Refer to the second paragraph of response to comment BOEM-2024-0001-0400-0003.
BOEM-2024-0001-0400-0012	The Service is still concerned that derelict fishing gear is anticipated to get tangled and gather around WTG turbines but simultaneously foraging opportunities around the WTG are supposed to increase for marine birds. If the foraging opportunities at WTGs are better than surrounding areas then birds will be attracted to the turbines and have an increased risk 1) of direct collision with turbines and/or 2) have increased risk of entanglement with debris while foraging around turbine bases especially for deep diving species.	Refer to the second paragraph of response to comment BOEM-2024-0001-0400-0003.
BOEM-2024-0001-0400-0013	USFWS Draft Programmatic Environmental Impact Statement Comments: Within the presence of structures section of Chapter 3.5.3.3.3 BOEM explains that "Potential annual bird kills from WTG collisions would be relatively low compared to other causes of migratory bird deaths throughout the United States. For instance feral cats are the primary cause of migratory bird deaths in the United States (2.4 billion per year) followed by collisions with building glass (599 million per year) collisions with vehicles (214.5 million per year) poison (72 million per year) collisions with electrical lines (25.5 million	BOEM included the USFWS bird mortality data in the PEIS to provide context for potential bird mortality that could occur from offshore wind. BOEM notes that the PEIS paragraph before the one cited by the commenter (page 3.5.3-16) states that the USFWS estimates an average of 320,000 birds killed annually in the United States from onshore wind farms (totaling 49,000 turbines); this is approximately 0.001 percent of all bird mortality from all causes (based on mortality data provided by USFWS at https://www.fws.gov/library/collections/threats-birds). With the

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	per year) collisions with communication towers (6.6 million per year) and electrocutions (5.6 million per year) (USFWS 2021)."Please consider take from wind turbines in an additive context to other sources of anthropogenic bird mortality. Many of the species harmed by the other factors listed here are declining and adding additional mortality to these populations may cause steeper declines and/or prevent populations from recovery. This sort of justification for acceptable take for wind development should be reconsidered.	current understanding that bird presence in the offshore environment is low compared to onshore/nearshore, and knowing that onshore wind turbines cause a fraction of a percent of all bird deaths annually and the total number of anticipated offshore WTGs on the OCS is much smaller than the number onshore, BOEM does not think it is unreasonable to consider this information as a factor in concluding that offshore WTGs are unlikely to have a measurable effects on bird populations (even in an additive context). BOEM understands that bird species protected under the Endangered Species Act (ESA) are more sensitive to potential impacts, and BOEM is addressing those concerns in more detail as part of their consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, which was initiated on June 20, 2024.
BOEM-2024-0001-0400-0014	Section #: 3.5.3.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 1 on this page: Please provide an explanation of how the analysis in Table 3.5.3-1 was conducted. Without an explanation it is not possible to interpret the importance of the values in the table.	The detailed description/explanation of the methods and results that generated the information in PEIS Table 3.5.3-1 can be found in Winship et al. (2018), which is the reference for Table 3.5.3-1. The body of the Winship et al. (2018) report can be accessed at BOEM's website at https://espis.boem.gov/final%20reports/BOEM_2018-010.pdf. The data in Table 3.5.3-1 was taken directly from the 47 pages of tables in Appendix D of the Winship et al. (2018) report, which can be accessed on BOEM's website at https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/AppendixD.pdf. However, BOEM notes that the Winship et al. 2018 report has been updated with new data (see Winship et al. 2023 in the PEIS) that has replaced the Winship et al. 2018 data in the PEIS. Therefore, Table 3.5.3-1 has been updated with this new information. Winship et al. 2023 can be found at https://espis.boem.gov/Final%20Reports/BOEM_2023-060.pdf; the data shown in PEIS Table 3.5.3-1 can be found in Appendix H.

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BOEM-2024-0001-0400-0015	Section #: 3.5.3.1 USFWS Draft Programmatic Environmental Impact Statement Comments: How did this table contribute to the impact determinations? If it was used for more than background information there is a need to explain how these percentages of the "population" would be used to support negligible minor moderate major impact determinations.	The bird population data in PEIS Table 3.5.3-1 is used to show the estimated bird presence in all anticipated offshore wind energy development on the OCS. As shown in the table, the population percentage of each bird species that overlaps with these areas is very low, ranging from 0 to 4.1 percent, with most species' populations below 1 percent. With such low percentages of bird populations potentially exposed to all anticipated offshore wind development on the OCS, BOEM believes it is reasonable to conclude that the impact or risk would be low for these bird populations. If the potential impacts are put into the context of the impact definitions defined in PEIS Table 3.5.3-3, it is reasonable to conclude that bird impacts are unlikely to be measurable or would be so small that they would be extremely difficult or impossible to discern or measure, and would never reach the level of affecting populations.
BOEM-2024-0001-0400-0016	Section #: 3.5.3.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 2 on this page: These datasets and UDs are from a small sample size of birds captured from the mid-Atlantic and therefore are not representative of the entire Atlantic populations and should not be used to determine absence from a given location.	Based on the full context of the comment in the original comment table submitted, it is unclear what specific page is being referenced in the comment, but it appears to be PEIS page 3.5.3-7. The second paragraph on this page discusses satellite telemetry information for the surf scooter, red-throated loon, and northern gannet. This data is only one piece of information/data presented in PEIS Section 3.5.3.1 regarding bird use of the offshore environment. In this section, BOEM has presented all relevant and best available information/data on bird use in the geographic analysis area of the offshore environment. BOEM understands there are data gaps, uncertainties, and incomplete and unavailable information (refer to response to comment BOEM-2024-0001-0400-0003 on this matter).
BOEM-2024-0001-0400-0017	Section #: 3.5.3.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For the "Petrel Group" in this table: Leach's storm-petrels breed in the northern hemisphere and winter in the southern hemisphere Wilson's storm-petrels are the opposite as described in this table.	BOEM has deleted leach's storm-petrel as an example of a petrel that breeds in the southern hemisphere from PEIS Table 3.5.3-2.

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BOEM-2024-0001-0400-0018	Section #: 3.5.3.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For paragraph 1 on this page: Many species take a transoceanic route during migration (La Sorte at al. 2016 Stabile et al 2017). For example Blackpoll warblers make extended flights from the US East coast south across large expanses of the Atlantic Ocean to South America (DeLuca et al 2019). More data is needed to understand land bird migration patterns in offshore areas.	Refer to response to comment BOEM-2024-0001-0400-0003 for a discussion on data gaps, uncertainties, and incomplete and unavailable information.
BOEM-2024-0001-0400-0019	Section #: 3.5.3.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 3 on this page: Morphology alone should not be used to make such a broad statement about flight patterns in a specific area. There is evidence from eBird (see: https://ebird.org/map/baleag?neg=true&env.mi nX=&env.minY=&env.maxX=&env.maxY=&zh=false&gp=false&ev=Z& excludeExX=false&ex cludeExAll=false&mr=1-12&bmo=1&emo=12&yr=all&byr=1900&eyr=2 024) that suggest bald eagles make flights over ocean including one record in the NY Bight and several in the Gulf of Maine. We would like to see this sentence revised to suggest the potential for bald eagles to be offshore.	BOEM has revised the text on bald eagles and included eBird bald eagle observations along the New Jersey and New York coastlines, and the single observation about 40 miles (64 kilometers) offshore New Jersey in the New York Bight area.
BOEM-2024-0001-0400-0020	USFWS Draft Programmatic Environmental Impact Statement Comments: For table 3.5.3-3: It is challenging to assess the accuracy of impact determinations when there is a lack of definitions associated with these benchmarks. For example there should be a clear definition or understanding of the "population" "population-level effects" and different effect types (i.e . "severe" "long- term" or "population-level").	For more information on impact terminology used in PEIS Chapter 3, see PEIS Section 3.3.2, *Impact Terminology*.
BOEM-2024-0001-0400-0021	Section #: 3.5.3.3.3 USFWS Draft Programmatic Environmental Impact Statement Comments: For paragraph 2 on this page regarding "Lighting": Why would this not be expected to increase collision risk? Avian vessel strikes largely occur during the night or twilight hours when visibility is reduced and birds are exposed to artificial lighting (Black 2005 Merkel 2010). Many bird species are known to be attracted to artificial lighting at night including many seabird and landbird species (Hppop et al. 2016 Rodriguez et al. 2017). Poor weather conditions increase the risk of avian collision (Black 2005 Merkel 2010 Ronconi et al. 2015).	BOEM has revised the text to clearly indicate the collision risk from construction vessel lighting.

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BOEM-2024-0001-0400-0022	Section #: 3.5.3.3.3 USFWS Draft Programmatic Environmental Impact Statement Comments: For paragraph 1 on this page: This study focuses on a single species and relies heavily on simulation not empirical data and therefore should not be used to make definitive statements about the entire community.	BOEM acknowledges the study focuses on a single species and relies on simulation (refer to response to comment BOEM-2024-0001-0400-0003 for a discussion on data gaps, uncertainties, and incomplete and unavailable information). However, additional studies are referenced later in the section, including the Vattenfall (2023) study on page 3.5.3-21. Vattenfall recently studied bird movements within an offshore wind farm. The purpose of the study was to improve the understanding of seabird flight behavior inside an offshore wind farm with a focus on the bird-breeding period and post-breeding period when densities are highest. The study was robust in that seabirds were tracked inside the array with video cameras and radar tracks, which allowed for measuring avoidance movements with high confidence and at the species level. Detailed statistical analyses of the seabird flight data were enabled both by the large sample sizes and by the high temporal resolution in the combined radar track and video camera data. Meso-avoidance behavior showed that species avoided the rotor-swept zone (RSZ) by flying in between the turbines, with very few avoiding the RSZ by changing their flight altitude to fly either below or above the rotors. The most frequently recorded adjustment under micro-avoidance behavior was birds flying along the plane of the rotor; other adjustments included crossing the rotor either obliquely or perpendicularly, with some birds crossing the rotor swept area without making any adjustments to the spinning rotors. The study concluded that, together with the recorded high levels of micro-avoidance in all species (>0.96), seabirds would be exposed to very low risks of collision in offshore wind farms during daylight hours. This was substantiated by the fact that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the 2 years of monitoring covering the April–October period. The study's calculated micro-avoidance rate (>0.96) is similar to Skov et al. (2018) (also cited in the PEIS).
BOEM-2024-0001-0400-0023	Section #: 3.5.3.3.3 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 2 on this page: Currently there is no evidence to suggest offshore mortality rates will be similar to onshore rates because the conditions are extremely different (e.g. it	BOEM has revised the presence of structures IPF section in PEIS Section 3.5.3.3.3, which resulted in this removal of the paragraph. Refer to response to comment BOEM-2024-0001-0400-0013 on

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	is an entirely different ecosystem with different bird behaviors and movement patterns there is a very different species composition and the wind turbines are much larger). Therefore we feel it is inappropriate to definitively state that this is a worst-case scenario and recommend the removal of this statement.	why BOEM believes the USFWS turbine mortality data is a reasonable factor to consider for offshore wind.
BOEM-2024-0001-0400-0024	Section #: 3.5.3.3.3 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 4 on this page: Migrating birds typically fly at altitudes above the rotor swept zone; however they will gradually descend or climb at the beginning or end of each migration bout exposing them to lower altitudes or fly at lower altitudes during inclement weather (Lao et al. 2020 Elmore et al. 2021).	BOEM has revised the presence of structures IPF section in PEIS Section 3.5.3.3.3, which resulted in this removal of the paragraph.
BOEM-2024-0001-0400-0025	Section #: 3.5.3.3.3 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraphs 3 to 4 on this page: The entanglement of derelict fishing gear around wind energy related structures may not be a benefit for marine birds as stated. If the foraging opportunities at WTGs are better than surrounding areas due to a reef effect then birds will be attracted to the turbines and have an increased risk 1) of direct collision with turbines and/or 2) have increased risk of entanglement with debris while foraging around turbine bases. Many marine birds dive deep and hunting prey in a mass of derelict fishing gear increases the chance of entanglement.	Refer to the second paragraph of response to comment BOEM-2024-0001-0400-0003.
BOEM-2024-0001-0400-0026	Section #: 3.5.3.4.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 2 on this page regarding Lighting: Avian mortality has been reported on offshore energy platforms and structures from a variety of species including landbirds shorebirds rails Procellariids and Larids due to collision with structures while flying towards artificial lighting (Ronconi et al. 2015 Hppop et al. 2016 Gjerdrum et al. 2021). Poor weather conditions increase the risk of avian collision (Black 2005 Merkel 2010 Ronconi et al. 2015). Developers should be aware of strategies to reduce collisions of birds during inclement weather at night as well as inclement weather conditions which may increase collisions.	AMMM measure BIR-2 (see PEIS Appendix G) would require lessees to incorporate light reduction measures to avoid and minimize light attraction and bird collision impacts. Additional measures may be required as part of BOEM's terms and conditions for approvals of COPs for specific NY Bight lease areas that might be developed in the future, should BOEM decide to approve a COP.

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BOEM-2024-0001-0400-0027	Section #: 3.5.3.4.1 USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 3 on this page: How is it known that "impacts from suspended sediments would be short term and localized"? Please provide a citation. Otherwise this sentence should be changed to be less definitive.	Sediment disturbed by construction activities in water settle once the construction is complete. Therefore, the sediment is suspended for a short period of time and in the general area of disturbance, which means potential impacts on foraging birds that happen to be in the area during construction could be affected during that short period of time. There is a more detailed analysis on the suspension of sediment and recovery of benthic assemblages in PEIS Section 3.4.2, *Water Quality*, and Section 3.5.2, *Benthic Resources*.
BOEM-2024-0001-0400-0028	Section #: 3.5.3.4.1USFWS Draft Programmatic Environmental Impact Statement Comments: For Paragraph 3 on this page: This is based off of information derived when Wind turbine generators (WTG) were not offshore. We don't know if WTGs may attract birds through perching or foraging opportunities. More information from multi-sensor systems is needed to validate attraction as well as avoidance after construction.	Attraction to WTGs is mentioned in PEIS Section 3.5.3, Birds. BOEM recognizes that monitoring after construction may be necessary. Based on COP approvals to date, BOEM anticipates monitoring may be part of the terms and conditions of a future COP approval for any of the NY Bight lease areas, and adaptive management may be required if impacts deviate substantially from the impact analysis in the PEIS.
BOEM-2024-0001-0400-0029	Section Title: Table G-1. Adaptive mitigation for birds and bats. Section #: BB-3USFWS Draft Programmatic Environmental Impact Statement Comments: For clarification our original recommendation was to "Either work with the Service to develop a metric or remove the word substantially from the sentence. That word can be interpreted differently depending on the resource being impacted."	Thank you for your comment. BB-3 has been revised.
BOEM-2024-0001-0400-0030	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-1: Given their status under the Bald and Golden Eagle Protection Act bald and golden eagles should be included as species with immediate reporting requirements.	BOEM has revised BB-1 to include mention of eagles protected under the Bald and Golden Eagle Protection Act.
BOEM-2024-0001-0400-0031	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-2: Developers should also report any other form of tag such as MOTUS or satellite	BOEM has revised BB-2 to include reporting of any other form of tag such as MOTUS or satellite.
BOEM-2024-0001-0400-0032	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-2: Post-construction data (both survey and tracking data) will be of significantly lower value without pre-construction monitoring data.	Available preconstruction data could be incorporated in future COPs and analyzed at the project-level COP NEPA review and consultation stage.

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	Obtaining both pre- and post-construction data is particularly critical for understanding displacement one of the three main "issues" impacting birds outlined in Table 3.5.3-4 of the DPEIS. Therefore we strongly recommend that all post-construction monitoring is coupled with pre- construction data collection.	
BOEM-2024-0001-0400-0033	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-3: Since displacement (I.e. functional habitat loss) is one of the two primary negative effects of offshore wind we feel that the list of goals for the BBPCMP should include an additional goal that explicitly addresses displacement (e.g. "(4) to understand the magnitude and variation in potential displacement effects for the resident avian community").	Habitat displacement is project-specific and would be determined at the project-specific COP NEPA and consultations stage.
BOEM-2024-0001-0400-0034	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-3: We recommend incorporating non-listed species into tagging efforts along with listed species. Many non-listed species are of conservation concern and lacking movement information. We recommend coordinating tracking projects with the RWSC (Regional Wildlife Science Collaborative).	Thank you for your comment. BOEM has revised BB-3 to include "other species of concern".
BOEM-2024-0001-0400-0035	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-3: In order to detect displacement effects it is important to survey an additional buffer around lease areas. Please include the need to survey a 4-20 km buffer for digital aerial surveys	Buffers for digital aerial survey are project-specific and would be determined at the project-specific COP NEPA and consultations stage.
BOEM-2024-0001-0400-0036	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: For Measure ID BB-3: Please consider non-listed species in addition to listed species.	Thank you for your comment. BOEM has revised BB-3 to include "other species of concern".
BOEM-2024-0001-0400-0037	Section #: Appendix G USFWS Draft Programmatic Environmental Impact Statement Comments: Please ensure that "Nbat" is corrected to "North American Bat Monitoring Program (NABat).	Appendix G has been revised to replace Nbat with North American Bat Monitoring Program (NABat).
BOEM-2024-0001-0400-0038	USFWS Draft Programmatic Environmental Impact Statement Comments: BOEM did not respond to this comment. However a response was not necessary. The Services comment is applicable to the Draft Programmatic Environmental Impact Statement and ESA Section 7(a)(2) consultation.	Comment noted.

P.4.1.3 U.S. Environmental Protection Agency

Table P.4-4. Responses to Comments from the U.S. Environmental Protection Agency (BOEM-2024-0001-0435)

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BOEM-2024-0001-0435-0001	EPA acknowledges the purpose of the Draft Programmatic Environmental Impact Statement (PEIS) is to allow for tiering and reduce the need for redundant analyses for the six offshore lease areas. As such the Draft PEIS does not include the same level of detail as a project-specific environmental review. However EPA suggests that the Final PEIS clarify in the executive summary section the intended distinctions in the type of information to be provided in future NEPA documents. Although this is provided in Appendix C it would be helpful to include a brief description within the body of the PEIS. Additionally we recommend that the executive summary section also address what the public review process will entail for the subsequent construction and operations plan (COP)-specific NEPA documents.	Appendix C is referenced in the Executive Summary, Chapter 1, and in each Chapter 3 resource section, and it effectively points readers to the detailed recommendations by resource topic regarding how the PEIS may be incorporated by reference in the future COP-specific NEPA documents. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will consider the best available data and information that reflect the state of the science at the time of publication. The COP-specific NEPA process will follow BOEM's public involvement process, which will include holding a public comment period at the start of the NEPA process (scoping) and following the release of the Draft NEPA document whereby members of the public and agencies can provide input to help inform the NEPA process. Additionally, throughout the NEPA process, BOEM works closely with cooperating state and federal agencies and tribal governments to assist with assessing impacts and identifying mitigation measures.
BOEM-2024-0001-0435-0002	The Draft PEIS makes impact determinations for resource categories (ex. Air Quality Environmental Justice Wetlands Benthic etc.) where site-specific information and evidence (including modeling) is necessary in order to support that determination. Given the limited information available it is unclear how such impact determinations can be reasonably made. We are concerned that future tiered documents will rely on unsubstantiated impacts determinations presented in the Draft PEIS. We recommend that the Final PEIS clarify that COP-specific NEPA documents will not just adopt the impacts determinations from the Draft PEIS. Rather we expect that the future COP-specific NEPA documents will evaluate these resource areas	Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will consider the best available data and information that reflect the state of the science at the time of publication. At the time of the COP-level NEPA analysis, BOEM will determine to what extent information in the PEIS can be incorporated by reference into the COP-level NEPA document.

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	based on an appropriate level of analysis informed by site-specific data to arrive at an impact determination. EPA recommends that BOEM make it clear that this additional information be presented for public review at the project specific level.	For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area.
BOEM-2024-0001-0435-0003	Further EPA suggests that COP-specific NEPA documents provide a detailed discussion of impact determinations before and after the implementation of AMMMs. Given the broad and vague nature of the proposed AMMMs it is not clear how BOEM is able to substantiate impact level comparisons between the deferment of AMMMs (Alternative B) and the adoption of AMMMs (Alternative C) as it is expected that even if deferred many of the AMMMs would be applied on a lease-by-lease basis.	Refer to response to comment BOEM-2024-0001-0371-0004. The analyses in the PEIS do discuss impacts after implementation of AMMM measures. Depending on the specific IPF and the resource analyzed, there can be notable differences that change the impact determination for an IPF with implementation of AMMM measures under Alternative C. For example, see the Lighting IPF analysis for birds (PEIS Section 3.5.3) under Alternative B and Alternative C, where the impact was reduced from moderate to minor with implementation of an AMMM measure under Sub-alternative C. Future COP-specific NEPA documents for NY Bight lease areas would assess impacts in the context of any AMMM measures that would be implemented.
BOEM-2024-0001-0435-0004	As is stated in the Draft PEIS alternatives should "avoid or substantially lessen one or more significant socioeconomic or environmental effects." Although Alternative B is helpful for comparison of impacts between the full build with and without AMMMs it is not clear that Alternative B is an alternative that would meaningfully reduce impacts of the project. This is displayed in Table ES-2 as there are only 5 resource areas where the impact rating differs between Alternative B and Alternative C. EPA suggests that BOEM reframe the alternatives to better align with CEQ regulations at 40 CFR 1502.14(a) and DOI regulations at 43 CFR 46.420(b-c).	Refer to response to comment BOEM-2024-0001-0371-0004. The overall impact rating conclusions (as shown in PEIS Table 2-4 and *Executive Summary* Table ES-2) may not always be different under Alternative C when compared to Alternative B, while impacts for specific individual IPFs may be different. Depending on the specific IPF and the resource analyzed, there can be notable differences that change the impact determination for a specific IPF under Alternative C (see the Lighting IPF in PEIS Section 3.5.3, *Birds*, under Alternative B and Sub-alternative C1). However, the overall impact rating conclusions for the resource encompasses all IPF impact conclusions. The details of the analysis for each IPF and the justification for the overall impact conclusion for a resource is found in the Chapter 3 resource sections.
BOEM-2024-0001-0435-0005	Appendix C provides a description of how this PEIS will vary with tiered COP-specific NEPA documents. We encourage BOEM to provide a summary of resource areas where the adoption of AMMMs will mostly be based on information determined in COP-specific NEPA documents and those resource areas where AMMMs will include	Refer to response to comment BOEM-2024-0001-0371-0004 regarding revisions made to Alternative C and AMMM measures. Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through

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	regulatory requirements such as Section 7 National Marine Fisheries Service (NMFS) Consultation requirements. Additionally EPA suggests that a complete list of Plans to be required as part of the AMMMs be included in the PEIS.	related consultations. The applicability of these AMMM measures will depend on the project-specific COP submittals for the NY Bight, and BOEM cannot speculate how a future COP will fit within the PEIS. For special purpose statutes (e.g., ESA), the list of AMMM measures in PEIS Appendix G, Table G-1, does include AMMM measures that BOEM has proposed or that have been required by resource agencies to address impacts. Project-specific COP NEPA documents may also include additional AMMM measures beyond the AMMM measures in this PEIS to address project-specific impacts. The plans that are part of AMMM measures can be found in the AMMM measures listed in PEIS Appendix G, Table G-1.
BOEM-2024-0001-0435-0006	Appendix E provides an explanation of incomplete or unavailable information for each resource area. A statement similar to "Therefore BOEM believes that the analysis provided in the Draft PEIS is sufficient to make a reasoned choice among the alternatives in terms of coastal habitat and fauna" is made for each resource area. This is a confusing statement as it's not clear if further information will be needed to decide between alternatives in COP-specific NEPA documents. As much of the impact analysis for each resource area is being pushed to COP-specific NEPA documents this should be clarified.	Appendix E is applicable to the analysis detailed in the PEIS for the six NY Bight lease areas. Site-specific impacts associated with the construction and installation, O&M, and conceptual decommissioning of these facilities that deviate from the broad-scale analysis presented in the PEIS will be analyzed in subsequent COP NEPA EIS documents. Each COP NEPA EIS will consider the best available data and information that reflect the state of the science at the time of publication.
BOEM-2024-0001-0435-0007	The PEIS should include clarification on the timing of the Draft PEIS in relation to the issuance of COPs for each lease areas. It is EPA's understanding that COPs for the NY Bight lease areas have begun being submitted in early 2024.	BOEM's authority under the Outer Continental Shelf Lands Act (OCSLA) requires BOEM to review COPs once they are submitted by a developer. The timeline for COP submittal by the developer and the timing of the COP-level NEPA analysis varies depending on the lease area.
BOEM-2024-0001-0435-0008	Glauconite can create significant issues for offshore wind development. It is currently unclear whether geotechnical studies have been conducted to determine the presence of glauconite sands. We recommend conducting such studies as early as possible to inform the viable alternatives and potential impacts.	The PEIS acknowledges the possibility for glauconite soils to be present in the NY Bight lease areas and identifies potential impacts associated with glauconite. Thank you for your comment. These details will be addressed at the COP-specific level.
BOEM-2024-0001-0435-0009	COP-specific NEPA documents should provide additional information on the Unexploded ordnance (UXO) mitigation activities especially related to remediation for agency review. This should include but is	Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that will be included in

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	not limited to siting criteria mapping identification/classification of UXO type and discussion of whether/how each UXO will be monitored once relocated.	the NEPA EIS analysis for each resource area, including Other Uses. Each lease area will undergo project-specific environmental analyses through the development and submittal of a Site Assessment Plan (SAP) and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication.
BOEM-2024-0001-0435-0010	There are inconsistencies within the Draft PEIS with respect to the specified time for construction. For example, Figure 1-2 indicates that construction for projects typically occurs between 0-2 years as has been the documented constructed period in prior EISs issued by BOEM for offshore wind projects. However in 2.1.2.1.1 the Draft PEIS states that construction for offshore wind projects can take on average 3 to 5 years. We recommend these discrepancies in the timeframe for construction be clarified in the Final PEIS.	BOEM revised Figure 1-2 to show that construction could take up to 5 years. Construction timelines for each NY Bight project is expected to vary and could be more or less than the schedule estimates provided in the Draft PEIS. The project-level NEPA reviews will analyze construction impacts based on the schedules provided in each COP.
BOEM-2024-0001-0435-0011	Alternatives Since all projects will be required to implement avoidance minimization and mitigation measures (either as required by this PEIS or COP-specific NEPA documents) it is unclear how there are differences in the impacts between Alternative B and Alternative C.	Refer to response to comment BOEM-2024-0001-0371-0004.
BOEM-2024-0001-0435-0012	EPA recommends that BOEM consider additional alternatives (some of which were dismissed from consideration) that would allow for a more meaningful comparison of impact minimization efforts.	Refer to response to comment BOEM-2024-0001-0371-0004.
BOEM-2024-0001-0435-0013	The PEIS should make clear if there may be differences in the efficacy of AMMMs between the alternatives.	Refer to responses to comments BOEM-2024-0001-0371-0004 and BOEM-2024-0001-0435-0003.
BOEM-2024-0001-0435-0014	The No Action alternative is intended to serve as a baseline for comparison to alternatives and evaluation of impacts. It's not clear how a No Action of not building the NY Bight Projects corresponds to an action alternative of the adoption of AMMMs. EPA recommends that future NEPA analyses include action alternatives that clearly address the purpose and need of the project as well as a No Action alternative that allows for meaningful evaluation of impacts.	As stated in PEIS Section 2.1, *Alternatives Analyzed in Detail*, the No Action Alternative analyzes the potential impacts from ongoing and planned non-offshore wind and offshore wind activities without development in the six NY Bight lease areas. Any potential environmental and socioeconomic impacts, including benefits, associated with offshore wind development of the six NY Bight lease areas as described under Alternative B or the AMMM

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		measures as described under the Proposed Action, would not occur. As clarified in PEIS Chapter 2, Alternative B serves to compare how impacts would change with AMMM measures analyzed in Sub-alternatives C1 and C2. BOEM will not approve any projects at the COP-NEPA stage without AMMM measures. Project-specific COP NEPA documents would also address the No Action Alternative, which will serve as the baseline against which the direct and indirect impacts of all action alternatives are evaluated for that specific project.
BOEM-2024-0001-0435-0015	Air Quality EPA recommends encouraging lessees to require the best available technology for marine vessels and non-road equipment. Many of the AMMMs for air quality seek to address this. It could be strengthened by broadening AQ-7 (Onshore measures: diesel engine emissions standards) to apply to marine vessel engines in addition to onshore equipment. If zero-emissions options are not available non-road equipment should meet "Tier 4 Final" standards rather than simply "Tier 4." This is relevant for some non-road equipment and is distinct from Tier 4 interim standards which allow for higher emissions of nitrogen oxides. For marine engines the highest tier may be Tier 4 or Tier 3 depending on the engine size.	BOEM has revised AQ-7 and included the CFR language for marine engine standards and the distinction between Tier 4 Final and Tier 4 Interim standards for non-road equipment.
BOEM-2024-0001-0435-0016	Page 3.4.1-9 states that "Construction activity would occur at different locations and could overlap temporally with activities at other locations including operational activities at previously constructed projects. As a result air quality impacts would be minor shifting spatially and temporally across the air quality geographic analysis area." The geographic or temporal variability does not necessarily result in only minor air quality impacts. The impact of other ongoing offshore wind activities included in the No Action Alternative have not been fully assessed.	The commenter is correct that geographic or temporal variability does not necessarily result in only minor air quality impacts. However, such variability can decrease the likelihood of impacts due to multiple emission sources operating at the same location for an extended time. Data are not available to evaluate impacts quantitatively from multiple projects across the air quality analysis area.
BOEM-2024-0001-0435-0017	Page 3.4.1-14 states that "A NY Bight project must demonstrate compliance with the NAAQS and must demonstrate no adverse impact on air quality related values (AQRV). The Outer Continental Shelf (OCS) air permitting process includes air dispersion modeling of emissions to demonstrate compliance with the NAAQS. As part of the AQRV analysis a NY Bight project must demonstrate that significant	For each project proposed for the NY Bight, the applicant will be responsible for performing the air quality analysis in accordance with BOEM and U.S. Environmental Protection Agency (USEPA) requirements and guidance.

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	visibility degradation at a Class I area would not occur as a result of increased haze or plumes." EPA reminds BOEM that the OCS air permitting process does not necessarily cover all air emissions associated with the project. NY Bight projects must conduct full analyses of all direct and indirect air emissions in order to determine the severity of the air quality impacts.	
BOEM-2024-0001-0435-0018	Additionally please note for future COP-specific NEPA documents that the AQRVs includes visibility and acid deposition at the Class I area and are regulated by the Federal Land Manager (FLM) of that Class I area. In this case the Brigantine Wildlife Refuge is nearby. The FLM for Brigantine Wildlife Refuge is the US Fish and Wildlife Service (USFWS). o Additionally the visibility impairment is not limited to the Class I area but could also include other scenic vistas such as the Statue of Liberty. The scenic vista depends on the location of the source.	For each project proposed for the NY Bight, the applicant will be responsible for evaluating impacts on AQRVs at applicable Class I areas and at Class II areas designated by the FLM.
BOEM-2024-0001-0435-0019	BOEM anticipates that the air quality impacts associated with the project would be minor. However this remains largely unsubstantiated based on the information presented in the Draft PEIS. As currently written it is not clear whether a NAAQS violation may occur. Specifically Table 3.4.1-6. includes an estimate of criteria pollutant emissions from construction which are not annualized but total. Overall the analysis should ensure that any of the NY projects will not cause or contribute to a violation of any applicable NAAQS Prevention of Significant Deterioration (PSD) increment state air quality standards or other relevant standard during construction as well as determine if emissions would adversely impact air quality. We recommend the PEIS include a table with emissions of criteria pollutants in comparison with the NAAQS to clearly demonstrate whether a violation of NAAQS may occur.	For each project proposed for the NY Bight, the applicant will be responsible for performing the air quality analysis to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). The requested table is not included in the Final PEIS because emissions are expressed in units of mass per time (e.g., tons per year) and cannot be compared to the NAAQS, which are in units of mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$]) or volume per unit volume (e.g., parts per billion).
BOEM-2024-0001-0435-0020	Additionally although any given NY Bight project would have lower emissions than otherwise might be generated from another fossil fuel source there are still sizable emissions that are not negligible. This is further supported by BOEM's claims that it would take nearly the entire lifetime of the project (28 years of operation) to offset NOx emissions resulting from construction operations and	A determination of “minor” (as well as the distinction between "minor" and "moderate") is a qualitative evaluation. Because emissions levels alone do not determine concentrations, setting an impact level based on emissions is subjective.

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	decommissioning. In light of this statement it is unclear how a minor impacts determination may be made.	
BOEM-2024-0001-0435-0021	We recommend separating the greenhouse gas (GHG) and climate change section from the Air Quality section. This would aid in making relevant information regarding avoided and offset GHG emissions more readily accessible as GHG emissions are discussed throughout the Air Quality Section but the impact level definitions do not incorporate parameters to evaluate the significance of GHG reductions. We recommend evaluating GHG separately from NAAQs pollutants and developing impact level definitions specific to GHGs.	Because no project has greenhouse gas (GHG) emissions large enough to make a measurable difference to climate impacts, BOEM does not assign impact ratings specifically to GHG emissions.
BOEM-2024-0001-0435-0022	Table 3.4.1-9 presents the net emissions of CO2 for a single NY Bight project. EPA recommends that BOEM specify whether this refers to CO2eq. Additionally the Draft PEIS could benefit from a clarifying statement on how the total lifetime net emissions for the no action (emissions from the grid in absence of one NY bight project) was calculated.	The emissions in Table 3.4.1-9 are carbon dioxide (CO_2) not CO_2 equivalent. The table data are labeled properly as CO_2. The lifetime net emissions for the No Action Alternative (which has no avoided emissions) represents the amount of emissions that would occur from the grid (as configured in 2018) to produce the same quantity of electrical energy as would have been produced by one NY Bight project. This information has been added to Final PEIS Section 3.4.1, *Air Quality and Greenhouse Gas Emissions*, as well.
BOEM-2024-0001-0435-0023	The Draft PEIS concludes that air quality impacts due to a single NY Bight project within the air quality geographic analysis area are anticipated to be small relative to larger emission sources such as fossil-fuel power plants. In support of this claim footnote 5 provides the annual operational emissions from a single NY Bight project expressed as a percentage of the emissions from fossil-fuel power plants in New Jersey based on the USEPA 2020 National Emissions Inventory (USEPA 2023). As stated in CEQ's interim National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change "NEPA requires more than a statement that emissions from a proposed Federal action or its alternatives represent only a small fraction of global or domestic emissions. Such a statement merely notes the nature of the climate change challenge and is not a useful basis for deciding whether or to what extent to consider climate change effects under NEPA this approach does not reveal anything beyond the nature of the climate	The comparisons in footnote 5 apply to criteria pollutants, not GHGs, and are included to provide perspective on emissions from one NY Bight project relative to regional emissions from the fossil-fuel power plant sector. The CEQ guidance quoted by the commenter applies to GHGs, does not apply to criteria pollutants, and is not relevant to criteria pollutants outside the climate change context.

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	change challenge itself the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large effect."	
BOEM-2024-0001-0435-0024	Additionally the manufacturing of components and transit of vessels from other locations may contribute to emissions including global GHG emissions. It is not clear whether these emissions are currently included in the assessment. Where emissions cannot be reasonably estimated information such as lifecycle information may be useful (e.g. https://www.nrel.gov/analysis/life-cycle-assessment.html.) EPA suggests including a full accounting of direct and indirect emissions including upstream emissions that may result from the proposed action.	As stated in Final PEIS Section 3.4.1.4.1, emissions from manufacturing and other "upstream" sources are not included in the analysis. However, life cycle considerations are discussed in Section 3.4.1.4.1. As indicated in Section 3.4.1.4.1, although wind energy has higher upstream emissions than many other generation methods, its life-cycle GHG emissions are orders of magnitude lower than from other generation methods.
BOEM-2024-0001-0435-0025	EPA also recommends that GHG emissions for each alternative be provided to form a basis for comparison across alternatives.	Final PEIS Section 3.4.1.4.1 provides emissions for Alternative B. Section 3.4.1.5 discusses emissions for Alternative C and states that the estimated emissions with Sub-alternatives C1 and C2 would be the same as for Alternative B.
BOEM-2024-0001-0435-0026	Although at this time there is limited information on the potential ports to be utilized by each of the lease areas we recommend that future COP-specific NEPA documents carefully consider how impacts to port communities areas with pre-existing air quality impairments and low income and disadvantaged communities will be addressed as the projects proceed. We also note that while operation and maintenance facilities at or near some or all of the identified ports would be used for multiple offshore wind projects and have utility that is independent of any single project the impacts associated with the development or expansion of these facilities should be considered. To facilitate a clear analysis of air quality impacts we again recommend showing maximum modeled concentrations or emissions estimates from construction and operations and maintenance activities in comparison with NAAQS or other standards. This information should be provided in subsequent COP-specific NEPA documents.	Future COP-specific NEPA documents will consider air quality impacts on the relevant port areas and environmental justice communities.
BOEM-2024-0001-0435-0027	Section 3.4.1.4.3 states: "BOEM is considering conducting or participating in a regional modeling study that would assess	This study has not received financial support and will not commence prior to the issuance of the Final PEIS. BOEM intends

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	development impacts of six NY Bight projects along with other planned and reasonably foreseeable projects." EPA encourages BOEM to perform the study as the quantitative results would be a critical piece of evidence in the cumulative impacts section of the Final PEIS.	to revisit the matter of conducting a regional modeling study at a subsequent time.
BOEM-2024-0001-0435-0028	Climate change can make ecosystems resources and communities more susceptible as well as lessen resilience to other environmental impacts apart from climate change. In some instances this may exacerbate the environmental effects of the proposed action. We recommend that the climate change section in future COP-specific NEPA documents include consideration of climate resiliency measures particularly for infrastructure that may be vulnerable to the impacts associated with climate change (such as sea level rise more frequent storms etc.). This discussion would provide additional details regarding the durability of the proposed infrastructure (including wind turbine generators and buried cables at all locations) in the face of more severe weather and more severe sea states.	Future COP-specific NEPA documents will consider climate resiliency measures and the durability of the proposed infrastructure.
BOEM-2024-0001-0435-0029	Water and Natural Resources. The COP-specific NEPA documents should describe how AMMMs and any additional mitigation will be coordinated with current efforts to preserve the quality of water resources (for example the Barnegat Bay Comprehensive Conservation and Management Plan.)	Thank you for your comment. This coordination would be included in the COP-specific NEPA documents.
BOEM-2024-0001-0435-0030	The National Pollutant Discharge Elimination System (NPDES) permit program under the Clean Water Act (CWA) addresses water pollution by regulating point sources that discharge pollutants to waters of the United States. EPA recommends that BOEM and the lessees coordinate with EPA as project design progresses in order to determine the necessity of a NPDES permit. COP-specific NEPA documents should address any potential discharges from onshore or offshore project components (including wind turbine generators or offshore substations) and indicating whether they may be subject to NPDES permits.	Thank you for your comment. Section 3.4.2.3.2 provides a discussion of circumstances and activities that would require an NPDES permit. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. More specific information would be included in the project-specific COP-level NEPA analysis.
BOEM-2024-0001-0435-0031	In the discussion of water quality impacts associated with cable emplacement and maintenance the Draft PEIS applies the findings of the sediment transport model for Empire Wind in assessing the	A statement has been added to the Final PEIS Section, 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative,* to make clear to the reader that a project-specific, COP-level NEPA analysis will

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	implications of sediment suspension. The Draft PEIS should articulate the assumptions made in applying these results to the New York Bight lease areas and should disclose potentially different existing conditions that may make the findings of this model inapplicable to the sites being evaluated. Additionally EPA would look to future COP-specific NEPA documents to evaluate whether there may be regions within each lease area or corresponding near and on-shore components that may be more sensitive to sediment deposition or suspended sediment (such as tidal wetlands along the shoreline and shellfish harvesting areas). Subsequent COP-Specific NEPA documents should carefully assess potential impacts to these sensitive resources. Additionally EPA recommends a pre-and post- construction bathymetric survey be provided to ensure the sediment resettles over the proposed cables rather than disturb nearby benthic habitat.	provide greater details of the specific New York Bight lease areas and the possible impacts on resources from sediment resuspension and transport. Through the application of RP MUL-27, BOEM encourages lessees to explore ways to minimize potential impacts related to sediment disturbance.
BOEM-2024-0001-0435-0032	Furthermore the EPA recommends that subsequent COP-specific NEPA documents consider the following components related to water quality: o Port expansion could include dredging deepening and construction of new berths resulting in impacts on water quality through accidental spills leaks or discharges or sedimentation during port use. Any potential increases in erosion related to dredging should be addressed. EPA encourages BOEM to consider beneficial use of dredged material to the extent practicable. The PEIS should also include a discussion of potential disposal sites if known as each disposal alternative may have different requirements and/or result in potentially different impacts Waters of the U.S. and water quality. Specific information about cable corridors is not yet known. While EPA is generally supportive of the concept of shared or common cable corridors to reduce potential impacts to benthic resources and wetlands given the cable ranges included within the representative project design envelope we are not able to meaningfully assess the extent of impacts to arrive at a conclusion. Subsequent analyses should quantitatively evaluate the acreage of benthic habitats wetlands submerged aquatic vegetation and other sensitive resources/areas associated with various potential cable corridors routes to inform a determination of impacts. A map showing the coinciding resource areas intersected by cable corridors would also be	Thank you for your comment. Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*; *Port Utilization*, provides an assessment of the impacts on water quality from port utilization and possible port improvements. Port improvement projects are described in Appendix D, Section D.2.5. If the individual projects include other port improvement activities or components, the project-specific, COP-level NEPA analysis will provide further details. Analysis of impacts on benthic resources is provided in Section 3.5.2. The analysis of wetland impacts are provided in Section 3.5.8. Text has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, *Presence of Structures* IPF regarding emissions from anodes. Additionally, AMMM measure WQ-1 requires lessees to avoid using zinc sacrificial anodes on external components of WTG and OSS foundations to reduce the release of metal contaminants in the water column.

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	informative in demonstrating the potential scale of impacts associated with cable emplacement. o No consideration for impacts of turbine port infrastructure on wetlands is included in the analysis. Furthermore given the broad scope of the wetland impacts there is no consideration for the cumulative effects of the wetland impacts region wide. It is recommended that there be additional consideration of the cumulative impacts on wetlands including any impacts to wetlands' ability for natural inland migration as a consequence of project impacts. o Protective measures for corrosion of offshore wind structures have different potentials for emissions (e.g. galvanic anodes emitting metals such as aluminum zinc and indium; organic coatings releasing organic compounds due to weathering or leaching). While the current understanding is that chemical emissions from offshore wind structures is likely low the effects of multiple projects is not known. We recommend that BOEM consider commitments to water quality monitoring to better understand potential impacts and how they can be avoided or managed if necessary.	
BOEM-2024-0001-0435-0033	In future COP-specific NEPA documents EPA recommends that BOEM provide additional information documenting the anticipated location and type of scour protection to be used throughout the project area. Additionally if the scour systems are to be removed EPA recommends including this removal in a management plan that includes measures to avoid impacts to the seafloor bed as well as indicating where the material will be placed.	Thank you for the comment. The project-specific, COP-level NEPA analysis will provide greater details regarding location and type of scour protection. Additionally, any decommissioning activities, including the removal of scour protection, would be included in the decommissioning application required by BSEE.
BOEM-2024-0001-0435-0034	Additionally the COP-specific NEPA document should include sufficient information on how the selected project alternative is consistent with the CWA Section 404(b)(1) Guidelines to support permitting by the U.S. Army Corps of Engineers. Such a discussion would demonstrate how the proposed/selected alternative qualifies as the least environmentally damaging practicable alternative.	Thank you for the comment. The project-specific COP-level NEPA analysis will provide greater details on CWA Section 404(b)(1) guidelines for project alternatives.
BOEM-2024-0001-0435-0035	Land Use and Coastal Infrastructure The PEIS states that Port Utilization will result in minor beneficial impacts to land use and coastal infrastructure through economic activity and increased employment opportunities. EPA urges BOEM to consider impacts	The specific ports that the NY Bight projects will utilize are not yet known, nor are potential port upgrades that might be required. The PEIS analyzes representative ports to describe the types of impacts that could result from port utilization. Ongoing and

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	related to port upgrades and construction that will be required to facilitate their use as part of the NY Bight full build.	planned port upgrades within the geographic analysis are identified in Appendix D, *Planned Activities Scenario*, and are evaluated as part of the cumulative impact analysis. Specific port-related impacts will be analyzed at the COP NEPA stage when specific ports are chosen for each individual project.
BOEM-2024-0001-0435-0036	Indian Nation Coordination In the COP-specific NEPA documents EPA recommends including any lease area specific coordination with Indian Nations such as information received in public meetings or information received after the PEIS is finalized.	BOEM will continue to consult with Tribal Nations through the COP-specific environmental review process and will include summaries of Tribal coordination efforts and formal government-to-government consultation conducted for each COP in the respective NEPA documents.
BOEM-2024-0001-0435-0037	Environmental Justice (EJ) and Impacted Communities EPA recommends making the “Environmental Justice Community Mitigation Resources Plan” and the “Environmental Justice Communications Plan” available for federal cooperating agency and public review.	BOEM is exploring mechanisms to ensure plans and reports submitted under EJ-1 (now EJ-1a in the Final PEIS) will be made publicly available with a point of contact for the lessees.
BOEM-2024-0001-0435-0038	Additionally several of the AMMMs require substantial involvement from communities impacted by NY Bight projects. The document or the plans developed as per the AMMMs should make clear how public participate will be encouraged and what will happen if the public does not provide substantial feedback in the required AMMMs.	Refer to response to comment BOEM-2024-0001-0406-0021-c. EJ-1 (now EJ-1a in the Final PEIS), and EJ-3 have been revised to reflect community-based organization comments and now better reflect requirements to coordinate with residents and organizations in the creation of the plans. BOEM expects lessees to utilize best practices for meaningful engagement, and reporting requirements of the AMMM measures can still be submitted explaining what engagement activities occurred to seek coordination with EJ communities. Note that EJ-2 has been revised to be an RP as an "Environmental Justice Impact Mitigation Resources Plan" and includes language recommending coordination with residents and organizations in the development of the plan.
BOEM-2024-0001-0435-0039	EPA recommends that the final PEIS should be adjusted to reflect guidance from the Executive Order 14096 Revitalizing Our Nation's Commitment to Environmental Justice for All (April 21 2023) Section 3 (i) each agency shall "identify analyze and address disproportionate and adverse human health and environmental effects (including risks) and hazards of Federal activities on communities with environmental	BOEM agrees with EPA’s comment. The draft was written prior to the Executive Order. The Final PEIS reflects guidance from EO 14096. Resource areas found to have minor and moderate impacts should be included in COP NEPA analysis of disproportionate and adverse effects.

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	justice concerns." EPA encourages BOEM to revise the analysis of disproportionate and adverse effects to include consideration of resource areas found to have minor and moderate impacts. It is possible that minor or moderate impacts could constitute a disproportionate and adverse impact.	
BOEM-2024-0001-0435-0040	With respect to EJ-4 EPA recommends that BOEM provide additional justification for the derivation of the specified financial contribution to the compensatory mitigation fund. The timeframe for the funding coverage should also be clarified to address how construction and decommissioning periods (which may result in some of the largest impacts) may be included. Additionally it would be helpful to provide further information on the proposed allocation methodology and measures being considered to ensure equitable distribution of funds.	Refer to response to comment BOEM-2024-0001-0319-0004.
BOEM-2024-0001-0435-0041	Furthermore we strongly encourage BOEM to revise the current narrow criteria when defining "eligible impacts" for this mitigation measure. In particular we urge BOEM to include minor and moderate impacts when defining "eligible impacts" as these may still constitute a disproportionate and adverse impact to communities with EJ concerns. We would also suggest that BOEM further clarify what is meant by "direct" and "not otherwise mitigated." It's not clear if for example traffic related to port activity for a NY Bight lease area project would be considered direct as this is something that would make sense to include in such a mitigation measure. Additionally it is not clear what level of mitigation would constitute an impact being "otherwise mitigated" and therefore preclude it from being further mitigated through EJ-4. EPA suggests that BOEM more clearly identify how BOEM will decide what impacts will be considered for mitigation under EJ-4.	Refer to response to comment BOEM-2024-0001-0319-0004.
BOEM-2024-0001-0435-0042	The PEIS should clearly and effectively define the "reference community" and the "affected community" used in the environmental justice analysis. These definitions are used to determine whether there are disproportionate and adverse impacts by comparing the impacts to the affected community with the impacts to the reference community. A well-defined affected community will accurately reflect the demographic characteristics of the populations likely to be	BOEM acknowledges that the PEIS does not provide the specificity needed to determine whether there are disproportionate and adverse impacts or conduct a site-specific cumulative impact assessment (see section 3.6.4.2 on Scope of the Environmental Justice Analysis). The project-specific COP NEPA documents should include more detailed information that can better assess potentially affected communities and compare them with the

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	adversely impacted by the proposed project. A well-defined reference community will reflect the characteristics of the general population (e.g. municipal regional state).	appropriate level of demographic characteristics to determine whether there are disproportionate and adverse impacts from one project, or if there are cumulative impacts from multiple projects. The project-specific NEPA documents will also be subject to public comment.
BOEM-2024-0001-0435-0043	Additionally the PEIS would benefit from a baseline description of current existing stressors/pollution burden within these communities to better assess cumulative effects.	Thank you for your comment. Section B.5 of Appendix B, *Supplemental Information and Additional Figures and Tables,* has been revised to include baseline environmental conditions for each of the counties in the geographic analysis area exceeding environmental justice thresholds as identified in Section 3.6.4, *Environmental Justice*. BOEM acknowledges that the PEIS does not provide the specificity needed to determine whether there are disproportionate and adverse cumulative impacts for potentially affected communities with environmental justice concerns (see Section 3.6.4.2 on Scope of the Environmental Justice Analysis). The project-specific COP NEPA documents should include more localized baseline assessments of existing stressors/pollution burden in the proposed locations for the permit activities.
BOEM-2024-0001-0435-0044	The PEIS states in several locations that "A single NY Bight project could benefit environmental justice populations by displacing fossil fuel power-generating capacity within or near the geographic analysis area including at port locations." This statement is potentially misleading as it is not clear how BOEM and the leases would ensure that those fossil fuel power generating locations near environmental justice populations would be the ones displaced.	Thank you for your comment. The Final PEIS has been revised to communicate the conditions necessary for site-specific displacement of fossil fuel power-generating capacity. To the extent possible at the time of the COP NEPA documents, the COP NEPA documents should address how potential benefits may be felt by the population in and around the geographic analysis area.
BOEM-2024-0001-0435-0045	The COP-specific NEPA documents should provide an analysis of increased traffic around ports for both the construction and operation and maintenance phase of the project. As is stated in the PEIS this analysis will be specific to the ports selected for use and it is premature to state that impacts will be short-term.	BOEM agrees that the COP NEPA documents should provide an analysis of impacts of increased traffic around relevant ports throughout the project phases. Port vehicular traffic will be analyzed as a part of each project-specific COP NEPA document, including the cumulative impact of each project. Due to lack of location-specific information at this stage, the Final PEIS has been amended, and determination of short-term impacts related to air emissions and port traffic have been removed (Section 3.6, *Environmental Justice,* subsections 3.6.4.5.2 and 3.6.5.4.3). Increases in construction emissions will be short-term.

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BOEM-2024-0001-0435-0046	The PEIS states several benefits that can be expected as a result of the development of the NY Bight Offshore Wind Projects. It is helpful to include these benefits in the PEIS as part of the analysis but EPA would like to state that benefits to the project cannot be used to offset impacts. A full analysis of impacts should be included in the COP specific NEPA documents.	BOEM acknowledges that project benefits cannot be used to offset project impacts. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project.
BOEM-2024-0001-0435-0047	Additionally per Executive Order 13045 on Children's Health EPA recommends that BOEM consider impacts to places where children live learn and play such as homes schools and playgrounds. Future COP-specific NEPA documents should identify proximity to sensitive receptors and should implement AMMMs near these locations in order to be protective of children's health.	BOEM agrees that children’s health and other sensitive populations should be addressed in future COP-specific NEPA documents.
BOEM-2024-0001-0435-0048	Further the EJ analysis seems to compare county demographic data to state demographic data a broad scope that may not be an appropriate geographic comparison as it may dilute the presence of low-income communities that would be directly impacted by the project. The PEIS includes figures that represent more granular scales and text indicating that more community-based analysis will be conducted when the project scope is more fully defined but it is not clear how this will be incorporated into the EJ analysis. EPA recommends that BOEM consider census block groups or another appropriate geographic unit to capture localized impacts and most accurately reflect the potential presence of low-income communities and communities of color as is suggested in the Promising Practices For EJ Methodologies In NEPA Reviews (2016) report.	BOEM agrees that the PEIS does not include the specificity needed to make determinations regarding disproportionate and adverse effects at the community level (see Section 3.6.4.2 on Scope of the Environmental Justice Analysis). COP NEPA documents should include location specific demographic data on a more granular scale once the project scope is clearly defined. The COP NEPA documents should consider examining the smallest geography, census block groups, to capture localized impacts and ensure that siting decisions will not cause disproportionate and adverse impacts on the basis of demographic characteristics.
BOEM-2024-0001-0435-0049	There are several locations within the draft PEIS that broadly discuss dredged material disposal (2-12 3.1-2 3.4.2-8 3.5.2-22 D-12 and several locations within D1). Ocean disposal of dredged material excavated from the navigable waters of the United States requires an MPRSA permit (issued by USACE but reviewed and concurred by the EPA). We therefore recommend including a brief description of the MPRSA potentially under section 1.4 Regulatory Overview. Including brief information about the MPRSA in the Regulatory Overview will help any parties involved in offshore wind development determine	BOEM has added text to the Final PEIS and determined that the most appropriate place for this information is the discharges discussion in Table 3.1-1. Lessees would need to comply with all permitting requirements during the project-specific environmental review.

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	applicable laws and regulations and coordinate with USACE and/or EPA as necessary.	
BOEM-2024-0001-0435-0050	Table 3.1-1: Primary IPFs lists "dredged material ocean disposal" as one of the Sources or Activities that could produce an impact associated with offshore wind development. The MPRSA's applicability to dredged material disposal should be included in the description similar to the descriptions provided regarding NPDES permit requirements.	Text in Table 3.1-1 has been revised to include the Marine Protection, Research and Sanctuaries Act (MPRSA).
BOEM-2024-0001-0435-0051	The PEIS refers to unexploded ordinances in several locations however there is no mention of the National Guidance for Industry on Responding to Munitions and Explosives of Concern in U.S. Federal Waters developed by the U.S. Committee on the Marine Transportation System. After inviting public comment in the Federal Register the comment period on the National Guidance has now closed and it should be issued imminently. The National Guidance is intended to identify and help to coordinate federal statutory and regulatory authorities that approve regulate or permit the detonation removal or mitigation of munitions and explosives of concern (MEC) on the outer continental shelf. The EPA recommends that the final version of this PEIS refer to if not include text from the National Guidance.	Discussion of the National Guidance for Industry on Responding to Munitions and Explosives of Concern in the U.S. Federal Waters has been added to Section 3.6.7.1.2.
BOEM-2024-0001-0435-0052	There are several mentions in the document that refer to managing and/or modifying sand waves occurring on the seafloor (e.g. 2-12 3.5.2-22 3.5.5-21 3.5.5-36 and D1-17). In one example page 3.5.5-21 the document states that "[s]and waves that are dredged would likely be redeposited in areas containing similar sediments." The Final EIS should note that this type of activity may fall under the purview of the MPRSA if material is dredged or excavated from sand waves in the navigable waters of the United States. Project proponent should coordinate with USACE and/or EPA as necessary.	Text modifications were made within Section 3.5.2.4. “This type of activity may fall under the purview of the MPRSA if the material is dredged or excavated from sand waves in the navigable waters of the United States, lessees would coordinate with USACE and/or EPA as needed.”
BOEM-2024-0001-0435-0053	The potential for adverse marine impacts of the given alternatives primarily focus on impacts to marine mammals and ESA listed species. EPA recommends that the document expand consideration to and discuss the potential for adverse impacts to the marine environment	Analysis of potential impacts from the Proposed Action (Alternative C) and alternatives on the broader marine environment and other marine uses are found throughout the PEIS in the various resource topics that include the marine

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	generally and other uses of the ocean. The sections describing the cumulative impacts of the alternatives would be appropriate places to discuss these broader considerations.	environment (e.g., PEIS Section 3.4.2, *Water Quality*, Section 3.5.2, *Benthic Resources*). In addition, PEIS Section 3.6.7, *Other Uses*, discusses potential impacts on other uses not addressed in other sections of the PEIS, including marine minerals, national security and military use, aviation and air traffic, cables and pipelines, radar systems, and scientific research and surveys.

P.4.1.4 U.S. Coast Guard

Table P.4-5. Responses to Comments from the U.S. Coast Guard (BOEM-2024-0001-0370)

Comment No.	Comment	Response
BOEM-2024-0001-0370-0001	The USCG does not oppose the Proposed Action Alternative and recommends all Proposed Action avoidance minimization mitigation and monitoring (AMMM) measures pertaining to Navigation and Vessel Traffic be made mandatory. Additionally the USCG offers the following recommendations. Turbine Layout Proposed Action AMMM measures for consistent turbine layout marking and lighting incorrectly states turbines should have [Underline: one of the two lines] of orientation per lease area spaced at least 1 nautical mile (nm) apart to support navigation safety and Search and Rescue (SAR). Per Navigation and Vessel Inspection Circular (NVIC) 02-23 the Coast Guard recommends each windfarm be organized in straight rows and. columns creating a grid pattern consisting of two lines of orientation with at least 1 nm between turbines. Each windfarm's bathymetric circumstances are different and spacing of less than 1 nm may be unavoidable but programmatic AMMM measures applied throughout the NYB should align with NVIC 02-23. Deviations from this guidance should be assessed during project-specific environmental impact assessments and Navigation Safety Risk Assessments (NSRA) on a case-by-case basis for each lease area.	MUL-25 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. MUL-25 has been revised to be in alignment with Navigation and Vessel Inspection Circular 02-23, in which the Coast Guard recommends "each windfarm be organized in straight rows and columns, creating a grid pattern consisting of two lines of orientation." NVIC 02-23 does not create a requirement for 1 nm spacing between turbines.
BOEM-2024-0001-0370-0002	Marine Casualty Data In its assessment of affected environment and environmental consequences BOEM claimed to review pollution search and rescue and vessel incident data from 2017 to 2018. NVIC 02-23 recommends 20 years of marine casualty data in the study area	Search and rescue (SAR) incident data for 20 years has been incorporated in Table 3.6.6-3 to meet the requirements of Navigation and Vessel Inspection Circular (NVIC) 02-23. Navigation Safety Risk Assessments (NSRA) for each individual COP will still be

Comment No.	Comment	Response
	to provide an incident change analysis resulting from project development. One year of data is insufficient. If BOEM does not assess 20 years of data in the PEIS this assessment should not be tiered to or incorporated by reference and it is critical all future projects within the NYB study area carry out NSRAs in accordance with NVIC 02-23.	required, and project-specific NEPA analysis will be conducted for each COP.
BOEM-2024-0001-0370-0003	Project-specific NSRAs The USCG acknowledges National Environment Policy Act analysis for individual Construction and Operation Plans will tier to or incorporate by reference the NYB PEIS. However the assessment of potential increases in the likelihood for vessels to be involved in a collision or allision must be determined through project specific NSRAs. The NYB Draft PEIS uses NSRA data from ongoing projects in the vicinity of the NYB which is not an accurate assessment of impacts from future projects to be located within the NYB. All six NYB lease areas will have unique vessel traffic characteristics which must be assessed independently through project specific NSRAs as agreed upon by the USCG and BOEM (see Memorandum of Agreement OCS-06).	BOEM developed the PEIS prior to the issuance of any COPs and therefore relied on existing information, including COPs and NSRAs of nearby lease areas, to inform its analysis in the PEIS. As noted in Chapter 1, *Introduction,* the PEIS will not approve any projects, and all projects will be subject to additional project-specific NEPA analysis. The project-specific NSRAs will be developed in accordance with the current guidance, which includes future vessel traffic assessments. The project-specific NSRAs will be used to inform the COP-specific NEPA analysis.

P.4.1.5 National Marine Fisheries Service

Table P.4-6. Responses to Comments from the National Marine Fisheries Service (BOEM-2024-0001-0371)

Comment No.	Comment	Response
BOEM-2024-0001-0371-0001	[Bold: Analysis Structure and the Representative Project Design Envelope] The structure of the PEIS creates challenges for meeting BOEM's stated objectives for the document and for accurately characterizing potential resource impacts. The representative project design envelope (RPDE) approach does not provide a realistic estimate of actual build out in each lease area. Instead it considers a design envelope for one project and applies that to the six lease areas to assess the theoretical impacts of full build out rather than considering the lease-specific footprint and unique characteristics of each lease area. The analysis does not consider individual resources or habitats present among the leases nor does it include a detailed	The purpose of the PEIS is to present a programmatic analysis of the six NY Bight lease areas to characterize the types of impacts that could occur and mitigation measures that could minimize those effects. A detailed area-specific analysis that considers all potential impacts of development is more appropriate at the COP-specific stage when project details are known and site-specific survey data is available. Where information was available, impacts unique to each lease area were analyzed. Because project-specific details nor surveys have been prepared for each lease area, the level of information requested in the comment is limited. Regarding the Representative Project Design Envelope (RPDE) not

Comment No.	Comment	Response
	analysis of cumulative impacts resulting from a representative full build-out of all six leases. Where a cumulative analysis of impacts is provided it does not include further discussion of the effects and presents a limited assessment of the implications of the impacts. A detailed area- specific analysis that considers all potential impacts of development in the NYB would allow for a comprehensive evaluation of potential cumulative effects and the identification of specific AMMMMs to reduce those effects. We recommend BOEM update the PEIS to highlight and assess whenever possible resources and impacts that are unique to each of the existing NYB leases based on information currently available for these lease areas. This would allow for a full review of anticipated effects to protected species habitat fisheries and navigational conflicts across all lease areas to support the identification of appropriate AMMMMs. Such an approach would also provide a robust baseline to facilitate tiering of this analysis for project-specific decisions consistent with BOEM's intent and guidance for programmatic analyses.	being realistic, as stated in Section 2.1.2.1, the RPDE is not associated with any particular lease area and is instead representative of development that could occur associated with any of the six NY Bight lease areas. The RPDE was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey.
BOEM-2024-0001-0371-0002	[Bold: AMMMMs Analysis] The structure of action alternatives is a critical element of the document because it drives the comparative analysis of potential impacts to NOAA trust resources discloses trade-offs and supports development of effective mitigation measures. We support BOEM's description of Alternative A the No Action Alternative as a "true no action" under which no development would occur. This alternative will establish a baseline against which the action alternatives can be evaluated and is consistent with the approach that we have developed in coordination with BOEM in which the existing baseline for the No Action Alternative will only include past and ongoing activities and their effects.	Comment noted.
BOEM-2024-0001-0371-0003	We continue to support the inclusion, analysis, and use of a full build-out scenario without AMMMMs at the PEIS stage for analysis and discussion of potential impacts of development in the lease areas without the AMMMMs. Alternative B is intended to allow for a comparison to the impacts that could result from the programmatic adoption of AMMMMs under Alternative C. However, as written Alternative B assumes deferred adoption of AMMMMs to the COP	Refer to response to comment BOEM-2024-0001-0371-0004.

Comment No.	Comment	Response
	stage functionally equivalent to current practices for project reviews. This leaves Alternative B essentially functioning as a second No Action Alternative. While this has the potential to be useful for the purposes of comparison it leaves the document with a very limited range of action alternatives realistically capable of selection. The PEIS should clarify the distinction between adopting a suite of AMMMMs at this stage in the process versus at the project-specific COP stage. Below we suggest a path for expanding the range of reasonable alternatives and for providing more meaningful comparisons between alternatives.	
BOEM-2024-0001-0371-0004	To allow for a more meaningful comparative analysis we continue to recommend expanding the range of alternatives by updating Alternative C to include sub-alternatives with different combinations of AMMMMs to expand the range of action alternatives that could be selected. Individual projects will still be required to implement a host of AMMMMs through compliance with applicable statutes (e.g. the Endangered Species Act (ESA) the Marine Mammal Protection Act (MMPA) the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Outer Continental Shelf Lands Act (OCSLA)). Many standard measures associated with these statutes are fairly predictable based on our experience with offshore wind projects that have undergone review. Most of the AMMMMs included in the PEIS fall into the more standard AMMMMs category in contrast to a more programmatic approach to reducing impacts. This approach along with the design of Alternative B make it difficult to identify the potential effectiveness of adopting programmatic AMMMMs under Alternative C. Sub- alternatives under Alternative C could evaluate sets of AMMMMs ranging from minimum standard measures to levels of mitigation that may have more profound effects at the programmatic level. This approach would allow for consideration of measures that may reduce effects of construction (e.g. time of year restrictions for pile installation) alone and in combination with measures that may reduce effects of project operations (e.g. limiting locations of turbine foundations). However regardless of whether additional sub-alternatives are added we	BOEM has provided additional clarification on the purpose of Alternative B and has revised Alternative C to group AMMM measures into sub-alternatives (see Final PEIS Chapter 2). Alternative B serves to compare how impacts would change with the AMMM measures analyzed in Alternative C. Selection of Alternative B in the Record of Decision (ROD) would defer identification of AMMM measures to the COP-specific NEPA stage. The PEIS would not result in the approval of any activities, and BOEM would not approve any COP without implementation of mitigation measures. Alternative C has been divided into two sub-alternatives: Sub-alternative C1 and Sub-alternative C2. Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not previously been applied. These AMMM measures that have not been previously applied may be less familiar to the offshore wind industry but could further avoid and minimize impacts on resources if applied. In addition, BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any previously identified AMMM measure that is an RP has been removed from Alternative C. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts on resources but will not require them as a condition of

Comment No.	Comment	Response
	recommend that BOEM ensure the PEIS includes a more complete analysis of Alternative C as discussed further below. As currently written Alternative C is intended to cover all AMMMMs outlined in Appendix G. However in our view this list of AMMMMs should be expanded. Further the document as currently drafted does not address important aspects of the AMMMMs that are included in Appendix G. For example despite the overlap of projects with the Mid-Atlantic Cold Pool the PEIS does not consider or analyze effects to the Cold Pool from build out in the NYB and does not include any potential AMMMMs that may minimize adverse effects. Additionally while each section of the PEIS includes a suite of mitigation measures under each resource area those sections do not examine how these measures will be applied nor their efficacy based upon the RPDE parameters summarized in the PEIS. We recommend that the analysis include a comparative description of when and how each AMMMM would be implemented and the expected change in impacts due to implementing each measure. This would help BOEM to make an informed decision when selecting which AMMMMs will and will not be adopted at the programmatic level.	COP approval. AMMM measures from Sub-alternative C1 or C2, or a combination of both, may be required as conditions of approval for activities proposed by lessees in COPs submitted for the six NY Bight lease areas. BOEM may also require additional or different measures based on future, site-specific NEPA analysis of project-specific COPs. The PEIS addressed cold pools in Section 3.5.4, *Benthic Resources*; Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*; and Section 3.5.6, *Marine Mammals*.
BOEM-2024-0001-0371-0005	Many of the current AMMMMs are vague which makes it difficult to understand how they would result in meaningful reductions of adverse impacts from a project. Others are composed well but do not provide a clear linkage between the AMMMM and an avoidance minimization or monitoring of a particular impact. For example for BEN-2 (scour protection inspection) there is no clear linkage between the requirement to routinely inspect scour protection features (e.g. concrete mattresses rock etc.) and a reduction of adverse impacts to benthic habitats or Essential Fish Habitat (EFH). The efficacy of a standardized set of AMMMMs will be limited if there is no clarity and specificity in the substance and timing of the measures and how they would be implemented to reduce adverse impacts. For example one measure listed in Appendix G proposes a monitoring plan to avoid or reduce impacts to scallop populations (COMFIS-3) but it is unclear if this would be required in advance of Lessee submission of COPs or associated evaluation of project-specific impacts. If not required prior to project planning this limits the likelihood of altering project	BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any previously identified AMMM measure that is now an RP has been removed from Alternative C. BEN-2 was reclassified as MUL-41 because the measure does not directly mitigate impacts on benthic habitats or essential fish habitat (EFH). COMFIS-3 has also been updated for clarification. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C and RPs. Project-specific NEPA analysis for individual COPs could apply revised, additional, or different AMMM measures as needed.

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	components in a timely manner to minimize impacts to scallop populations or associated fisheries. While we support AMMMMs that facilitate collection of additional data to assess and avoid impacts if this type of data collection requirement is not put in place until the COP approval this and similar AMMMMs would be more likely to avoid and mitigate impacts for future projects instead of the existing six leases several of which are in the advanced planning and COP submission stages and have already begun development of initial project plans. Providing a broader range of AMMMMs and clarifying which AMMMMs will be mandatory conditions for all COP approvals and which ones may be required based on the details of a specific COP will provide predictable parameters for developers to follow and allow for a more robust analysis of the effectiveness of the AMMMMs at a programmatic level. There are several AMMMMs identified that do not implement any requirements or identify specific parameters that dictate Lessee adoption but rather defer to the Lessee to consider how they may or may not be incorporated into project planning. This approach creates challenges for evaluating the effectiveness of these AMMMMs. This is particularly true for the analysis of impacts to EFH in which the PEIS concludes there is no difference in impacts to EFH whether or not AMMMMs are adopted (Alternative B vs. C). This may be due to the fact that many of the AMMMMs aimed at minimizing habitat impacts do not include specific actions but defer to the Lessee to consider how to implement such AMMMMs (e.g. BEN-1 boulder avoidance/relocation; MUL-23). While we certainly support the consideration of avoiding sensitive habitats in project planning (as described in AMMMM MUL-23) the ultimate effectiveness of this AMMMM and any potential reduction in impacts to sensitive habitats would not be determined until the COP review stage. Additionally the EFH analysis and impact determination is primarily driven by the presence of structures yet there are no specific AMMMMs identified in Appendix G that would require avoidance or minimization of impacts to EFH from the presence of structures. As a result this lack of specific required action for avoidance/minimization for some AMMMMs limits BOEM's ability to meet the objective to analyze programmatic AMMMMs for the six	

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	NYB lease areas. We note the AMMMMs identified do not appear to follow the standard stepwise approach for mitigation consistent with NOAA's 2022 Administrative Order on Mitigation Policy[Footnote 1: Available at https://www.noaa.gov/organization/administration/noaa-administrative-orders-chapter-216-program- management/nao-216-123-noaa-mitigation-policy-for-trust-resources]. Such an approach first focuses on avoiding adverse impacts to high value habitats and resources. Following avoidance this approach would then call for minimizing the impact of activities by limiting the degree or magnitude of the impact action or its implementation. Finally any remaining adverse impacts that cannot be avoided or minimized should be offset or compensated for by replacement/replication or providing equivalent substitute resources or environments. This approach is also described in the 2024 NMFS-BOEM Right Whale and Offshore Wind Strategy. Following this approach would provide more clarity on how the AMMMMs would be implemented and ultimately modify the level of project impacts. We note that offsets and compensation may not be legally possible for all impacts including for example potential impacts to endangered species such as the North Atlantic right whale. As such avoidance may be the only option for certain impacts.	
BOEM-2024-0001-0371-0006	[Bold: Relationship Between PEIS and COP-specific Analyses] We understand that BOEM intends to use the final PEIS as the basis for tiering individual COP- specific analyses and that it will be incorporated by reference into future NEPA documents. However we have concerns that the current approach and level of detail in the draft PEIS will create challenges for tiering and limit meaningful uses of the PEIS. Appendix C is intended to describe how BOEM will approach tiering off of the PEIS and incorporation by reference but this section and Table C-1 remain vague. The document is also inconsistent and unclear in descriptions of what it means for AMMMMs to be formally adopted how those measures will be applied and when those AMMMMs would be effective. We appreciate BOEM's explanation that "the Record of Decision (ROD) for the PEIS will state which of the AMMMMs analyzed in the PEIS BOEM	BOEM has revised Alternative C to group AMMM measures into sub-alternatives (see Final PEIS Chapter 2): Sub-alternative C1 and Sub-alternative C2. Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus AMMM measures that have not previously been applied. These AMMM measures that have not been previously applied may be less familiar to the offshore wind industry but could further avoid and minimize impacts on resources if applied. BOEM intends to use AMMM measures identified at the programmatic stage to inform the selection of appropriate AMMM measures at the COP decision stage. BOEM may require the

Comment No.	Comment	Response
	has committed to adopting and for those that are not adopted the reasons why." However the PEIS also describes adopted measures as those which BOEM "would require as conditions of approval for activities proposed by lessees unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective" while other sections note that "BOEM may require" the selected measures. Without a definition of "adoption" for the purposes of these measures as well as clarity on whether selected AMMMMs will be required or remain optional for BOEM to require of individual Lessees it is difficult to determine whether the document will provide value for tiering project-specific analyses. Expanding the scope of sub-alternatives to evaluate commitment to various types and "mixes" of AMMMMs at the programmatic stage would facilitate a meaningful comparative analysis. We also request the document clarify how BOEM intends to handle any AMMMMs not adopted in the PEIS. It is unclear if AMMMMs that are not adopted will still be considered at the COP-specific NEPA stage and how the PEIS may be considered in BOEM's decision to require certain AMMMMs in the project-specific regulatory process. We recommend BOEM incorporate more details in Appendix C and describe the AMMMM adoption process consistently throughout the document so it is clear what the PEIS may mean for future project-specific regulatory processes.	AMMM measures from Sub-alternatives C1 or C2, or a combination of both, at the COP decision stage. BOEM may also require additional or different measures based on future, site-specific NEPA analysis of specific COPs. BOEM reviewed all AMMM measures in Appendix G and identified some measures that are RPs for the offshore wind industry. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts on resources.
BOEM-2024-0001-0371-0007	Executive Summary Section: ES.6 PDF Page: 35 Comment: Cumulative impacts to NARW from the No Action Alternative are stated as negligible to major here but in Chapters 2 and 3 it is stated only as major. Impacts should be described uniformly throughout the document. Section: ES.7PDF Page: 35Comment: Alternative B: Impacts to non-NARW mysticetes are stated to be negligible to moderate here and in Chapters 2 and 3 is reads only minor to moderate. Impacts should be described uniformly throughout the document.	Section 3.5.6, *Marine Mammals*, as well as the Executive Summary have been reviewed to ensure consistency in the impact determinations provided.
BOEM-2024-0001-0371-0008	Section: ES.2PDF Page: 27Comment: The PEIS notes that "BOEM may require additional or different measures based on future site-specific NEPA analysis or the parameters of specific COPs." In the case that an	Refer to response to comment BOEM-2024-0001-0371-0006.

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	AMMMM is not appropriate for a specific lease area as this statement suggests the site-specific NEPA analyses can document and explain how a different AMMMM would be a better fit in that situation. It is reasonable to assume that the six NYB leases may have different characteristics which may affect applicable AMMMMs for that project. As we note in our comments elsewhere we recommend that all the AMMMMs under consideration in Alternative C be considered as mandatory for each lease area in order to ensure a meaningful analysis of the potential efficacy of the suite of AMMMMs that BOEM will adopt through the PEIS ROD. In addition this would also help achieve the goal of the PEIS to reduce redundancies across COP-specific NEPA analyses.	
BOEM-2024-0001-0371-0009	Section 1 Section: 1.9 PDF Page: 48 Comment: As described in more detail in our comment letter we recommend the AMMMs follow the standard stepwise approach for mitigation which first focuses on avoiding adverse impacts to high value habitats and resources. Following avoidance this approach would then call for minimizing the impact of activities by limiting the degree or magnitude of the impact action or its implementation. Finally any remaining adverse impacts that cannot be avoided or minimized should be offset or compensated for by replacement/replication or providing equivalent substitute resources or environments. This approach is also described in the 2024 NMFS-BOEM Right Whale and Offshore Wind Strategy. Avoidance measures should be required prior to project planning which would increase the likelihood of altering project components in a timely manner to minimize impacts to our trust resources.	BOEM agrees that compensatory mitigation is the last step in mitigation hierarchy and that the project-specific COP NEPA stage will evaluate site-specific avoidance and minimization measures.
BOEM-2024-0001-0371-0010	Section 2 Section: 2.4 PDF Page: 83 Comment: It is unclear to NMFS why the cumulative impacts to NARW are stated as major for the no action alternative but are stated as a range of impacts for the action alternatives. Please be consistent in the way impact determinations are made (i.e. singular versus range). It appears that the same IPFs apply to both the action and no action alternatives.	The marine mammal PEIS section as well as the Executive Summary have been reviewed to ensure consistency in the impact determinations provided.
BOEM-2024-0001-0371-0011	Section: 2.4 PDF Page: 83 Comment: Alternative C: NMFS is concerned with the impact determination for NARW as reduced from major from the No Action Alternative. Consistent with comments on	As described in Section 3.1, *Impact-Producing Factors*, the No Action Alternative and action alternatives analysis include the current conditions and future baseline conditions. The No Action

Comment No.	Comment	Response
	OSW EISs if the status quo is expected to be major impacts no AMMM measures would address the ongoing and planned actions of the status quo. Therefore NMFS requests this be changed to major impacts for NARW. Additionally this is a different conclusion from what is in Table ES-2 where it reads impacts would be moderate but matches the conclusions in Chapter 3. Section: 2.4PDF Page: 83Comment: Alternative C: NMFS requests this sentence clarify which marine mammals are anticipated to be impacted "Impacts resulting from pile-driving noise would be reduced to minor for one project and remain the same moderate for six projects under Alternative C."	Alternative and action alternatives *cumulative* analyses include ongoing and planned non-offshore wind and offshore wind activities. However, the action alternatives analysis does not include the ongoing and planned non-offshore and offshore wind activities. Therefore, the impact determinations for the action alternatives analysis can be less than the cumulative impacts of the No Action Alternative. The action alternatives cumulative analysis, on the other hand, would always have the same or greater impact determinations than the No Action Alternative cumulative analysis due to the inclusion of ongoing and planned non-offshore and offshore wind activities. Please refer to Figures 3-1 through 3-4. The marine mammal PEIS section as well as the Executive Summary have been reviewed to ensure consistency in the impact determinations provided. Additionally, the impacts for Alternative C were reduced from major because this includes the implementation of AMMM measures (including vessel strike avoidance measures) for all vessels associated with the representative offshore wind projects assessed in Alternative C, such that BOEM does not believe vessel strikes would occur for North Atlantic right whale (NARW). Because all six projects under Alternative C would follow these same AMMM measures, the risk is not expected to increase to major between one and six projects because the implementation of these AMMM measures for NARW vessel strike avoidance would continue to be effective such that vessel strike would not occur. The only scenarios in which BOEM considers vessel strike a major impact for NARW are Alternative A and cumulative impacts for Alternatives B and C because the non-offshore wind–related vessel traffic would not follow the same AMMM measure requirements as OSW vessels and ongoing Unusual Mortality Events (UME) for NARW suggest vessel strikes are occurring and therefore cannot be discounted. Text has been updated and clarified throughout all alternatives to clarify that the driver of the major impact determination is the non-offshore wind vessel traffic, and any alternatives considering ONLY offshore wind vessels would have reduced impacts with implementation of the AMMM measures.

Comment No.	Comment	Response
BOEM-2024-0001-0371-0012	Section 3.5.2 Benthic Resources Section: Global PDF Page: Comment: BOEM dismissed the Benthic Habitat Impact Minimization alternative NMFS suggested in our scoping comments due to the unknown location of cables at this stage. However including areas as off-limits to development as part of a potential AMMM would allow analysis of the benefits of avoiding these areas. This would add value to a programmatic analysis of benthic habitat impacts in the NYB overall. Below is detail about Prime Fishing Grounds and overlap of lease areas with the mid-shelf scarp (MSS):We recommend avoiding the Mid-Shelf Scarp (MSS) for development. The MSS is a regional-scale bathymetric feature of high slope (rapid change in depth) that bounds the eastern side of the Mid-Shelf Wedge. Bathymetric features such as the MSS act as congregation areas for many species of finfish shellfish and diverse invertebrate species that are essential to marine ecosystem functioning. Seafloor features like the MSS modify physical processes - such as hydrodynamic flow and nutrient concentration - and ecological patterns; commercial and recreational fishers often target these areas which can have high catch-per-unit-effort. It appears that eastern portions of Lease Area OCS-A 0538 and OCS-A 0539 overlap with the MSS. This area of overlap also includes a large designated Prime Fishing Ground known as "The Wall" which appears to be a reference to the rapid change in depth of the MSS. Avoiding development on the MSS is important because changes to the complex physical structure of this feature may lead to long- term or permanent adverse impacts on species use and productivity. Development should be avoided on the MSS and within 1600 meters on either side of the MSS (3200 meter bidirectional buffer of the centerline of the MSS).More specifically portions of Lease Area OCS-A 0538 primarily blocks/aliquots 6315 6316E 6316I 6316J 6316M 6316N 6366A 6366E 6365 6415D and 6415C overlap with the MSS. Additionally the southern tip of Lease Area OCS-A 0539 primarily blocks/aliquots 6611H 6611K and 6611J also appear to overlap with the MSS. Much of the MSS follows the -50 meter bathymetric contour but should be identified and mapped with high-resolution site-specific surveys for projects that may overlap with the feature. Development should be avoided on the MSS and within 1600 meters on either side	Thank you for your comment. The NY Bight lease areas were designed to avoid certain commercial fishing activity based on stakeholder inputs and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid the MSS (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/ATLW-8-NY-Bight-Final-Lease-Sale-Decision-Memorandum.pdf). BOEM will evaluate project-specific impacts based on the project-specific COP before issuing an ROD. Benthic mapping and sampling will inform the project-specific details and design including the type of foundation proposed and how much scour would be required, as well as the bedforms present and any plans for disturbance of the bedforms. The project-specific COP NEPA EIS analyses will also address potential impacts in various habitats from the proposed project. The caveat stating that the characteristics of the NY and NJ Wind Energy Areas (WEA) may not be present in the six leases covered by this PEIS and new features may be in the NY Bight WEAs that are not already present in the NY and NJ WEAs, has been added. At the programmatic level, too many details about each potential project remain unknown to be able to provide a more robust impact analysis of the NY Bight projects. Refer to the response to comment BOEM-2024-0001-0346-0013 for a response to larval transport and hydrodynamic changes. Miles et al. 2021 studied the potential effects of offshore wind farms on the Mid-Atlantic Bight Cold Pool (Miles T., S. Murphy, J. Kohut, S. Borsetti, D. Munroe. 2021. Offshore Wind Energy and the Mid-Atlantic Cold Pool: A Review of Potential Interactions. Marine Technology Society Journal 55:72-87). See discussion in Section 3.5.6.3.3. The cumulative impacts analysis for the Proposed Action considers the full build out of the six New York Bight lease areas in combination with other reasonably foreseeable planned activities, including offshore wind activities, within the geographic analysis area for each Chapter 3 resource topic.

Comment No.	Comment	Response
	of the MSS (3200 meter bidirectional buffer of the centerline of the MSS). Section: Global PDF Page: Comment: This section would benefit from inclusion of more specific and quantitative analysis and direct discussion of effects. The addition of figures as visual aids is strongly recommended. At present the section provides an overly broad description of the activities with impacts and effects that appear to be understated or minimized. For example it would be helpful to show a summary of benthic habitat conversion from existing bottom to bottom occupied by WTG and OSS foundations and associated scour protection based upon type and size. Additionally there is little discussion of the effects and implications of mobile bedform removal during seabed preparation activities. Further it would be beneficial to provide a similar or greater level of description of the resources bedforms and characteristics of the 6 leases included in the PEIS consistent with what was provided in descriptions of the New York and New Jersey WEAs (see 3.5.2.1.1 pg 3.5.2-5). It is also recommended that the document more clearly state that the characteristics of the NY and NJ WEAs may not be present in the 6 leases covered by this PEIS and that in reverse the 6 leases may include benthic features and resources not present in the NY and NJ WEAs. Section: Global PDF Page: Comment: When discussing the impacts of one or all 6 projects it would be helpful to distinguish the geographic location of the impact(s) - the OCS nearshore estuarine or riverine areas. This reduces uncertainty in understanding the potential impacts and effects from a particular IPF where impacts and effects may differ from the same IPF by location and habitat type. For example cable preparation and installation in estuarine habitats with finer sediments seagrasses and shellfish reefs will be impacted differently (more severely) than non-vegetated mostly sandy habitats of the OCS. In estuaries sediment transport and disturbance of sensitive resources will not have the same recovery times (if recovery is possible) as the environments of the OCS and these differences are not clear from the current format of the document. We recommend	

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	the document more clearly provide separate discussions of IPFs and effects for the OCS nearshore estuarine and riverine environments. Section: Global PDF Page: Comment: A robust substantive discussion of the cumulative and synergistic regional impacts of IPFs from 6 projects is needed under Alt. B. This should be followed by a clearly defined relationship between specific AMMMs and cumulative regional impacts under Alt. C. Subsequent examples in this spreadsheet should be used as a reference for areas deficient in discussion and should be carried throughout. This includes but is not limited to: discussion of changing hydrodynamics and wake effects; regional cumulative impacts on larval transport; distribution formation and breakdown of bedforms; formation and breakdown of the mid-Atlantic Cold Pool (a model should be developed similar to the one described for Rhode Island and Massachusetts leases); cumulative regional effects from cable and converter station heat; and cable EMF. Although these IPFs were addressed there is little substantial supporting information for conclusions that on a single project or regional scale effects would be negligible or minor.	
BOEM-2024-0001-0371-0013	Section: 3.5.2 PDF Page: 174 Comment: Please provide a resource or other evidence to support the statement that sediment transport would likely be on a spatial scale of less than 10 miles. Section: 3.5.2.1 PDF Page: 176 Comment: Please provide clarity and consistency in describing the analysis area. For example are estuaries and rivers included? Section: 3.5.2.1 PDF Page: 176 Comment: Please elaborate on the importance of the Gulf Stream Labrador Current and the Mid-Atlantic Cold Pool as regional oceanographic features. This should include but is not limited to the importance of the Cold Pool's stratification on nutrients and primary production commercial and recreational species distribution and tempering the impacts of hurricanes. Please also include a clearer description of the geographic extent of the Cold Pool as it relates to the 6 leases in this PEIS. A more robust description of the regional oceanographic conditions is warranted. Section: 3.5.2.1 PDF Page: 177 Comment: NMFS recommends updating the figure to make leases transparent so that the underlying	As stated in Section 3.5.2, "Although sediment transport beyond 10 miles (16.1 kilometers) is possible, sediment transport related to the NY Bight project activities would likely be on a smaller spatial scale than 10 miles (16.1 kilometers); project-specific sediment transport modeling would be required to verify this." This is based on sediment transport modeling conducted for other proposed offshore wind farms, which found that sediment deposition from the seafloor disturbance during cable emplacement was estimated to fall very close to the disturbance. Empire Wind results found deposition of 0.004 inch (0.01 centimeter) within 246 feet (75 meters). Atlantic Shores found deposition of ≥ 0.04 inch (1 millimeters) in thickness would occur within 656 feet (200 meters) from the Monmouth ECC centerline, within 164 feet (50 meters) of the Atlantic ECC centerline, and within 361 feet (110 meters) of the centerline for jet trenching installation of the interarray cables. The geographic analysis area includes offshore waters from Montauk Point on Long Island, New York, southwest into the NY

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	seabed topography can be seen or providing a second figure with only lease area borders (thin black line). Section: 3.5.2.1.1 PDF Page: 178 Comment: Please provide a figure showing the mid-shelf scarp as it overlays with leases 0538 and 0539 and elaborate on the importance of the feature for species community composition and fishing grounds (see Global comment above). Section: 3.5.2.1.1 PDF Page: 179 Comment: BOEM states that winter storms can reshape the upper 20-39inches of sediments within a few hours. Please provide analysis on how this normal process may be altered by the introduction of structure to the OCS and the effects of the altered process on benthic bedforms benthic resources and Essential Fish Habitat. Section: 3.5.2.1.1 PDF Page: 179 Comment: Guida et al. 2017 should not be exclusively replied upon as a proxy to characterize the 6 leases in the PEIS. Instead a study similar to or exceeding in complexity should be conducted for the leases discussed in the PEIS. Additionally trawl and other survey data are available from NMFS state agencies and academic partners to provide insights on non-commercial species distribution (non-targeted but collected species). USGS and NOAA should be consulted for outer continental shelf bedform and benthic habitat characteristics. Publications such as Sylvia Nordfjord John A. Goff James A. Austin Laurie Schuur Duncan Shallow stratigraphy and complex transgressive ravinement on the New Jersey middle and outer continental shelf Marine Geology Volume 266 Issues 14 2009 Pages 232-243 is an excellent starting point that includes additional valuable references.	Bight, and west to Cape May, New Jersey, and includes both the offshore project areas and potential export cable corridors that may traverse inshore benthic habitats in coastal inlets, estuaries, and bays in state waters. Terrestrial resources in coastal areas are discussed in further detail in Section 3.5.4*, Coastal Habitat and Fauna*; tidal wetlands are discussed in Section 3.5.8, *Wetlands*. Text was added to address the Mid-Atlantic Bight Cold Pool in Section 3.5.2.1. Updated figures will occur within project-specific COPs, once benthic mapping and sampling have been conducted, and will be used to inform the project-specific details and design. Unfortunately, no studies exist to analyze what role offshore wind farm monopiles play in the alteration of the upper seafloor sediment during winter storms. Project-specific COPs will contain more details about the results of benthic surveys and sediment samples associated with that particular lease area. Nordfjord et al. 2009 is already cited within Section 3.5.2.1.
BOEM-2024-0001-0371-0014	Section: 3.5.2.1.2 PDF Page: 181 Comment: A minor point of clarification - although eelgrass is a dominant species in estuarine environments widgeon grass is increasingly prevalent in brackish and estuarine waters and in some cases is out-competing eelgrass. Additionally maps of SAV resources in New Jersey estuaries are available on the NJ Dept. of Environmental Protection website. Section: 3.5.2.1.2 PDF Page: 182 Comment: Please include a discussion of other prevalent commercial and recreational bivalves	Thank you for your comment. Widgeon grass is mentioned as being present within NY and NJ estuarine waters. Mapping of nearshore marine and estuarine habitats will occur in project-specific COPs, once export cable corridors and landfalls are proposed. Section 3.6.1 provides discussion of commercial and for-hire recreational bivalves.

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	including hard clams (*Mercenaria mercenaria*) soft clams (*Mya arenaria*) and bay scallops (*Argopecten irradians*) and their habitats.	
BOEM-2024-0001-0371-0015	Section: 3.5.2.3.2 PDF Page: 185 Comment: The determination that accidental releases of fuel fluids or hazardous materials would cause harm to benthic species is understated. Please elaborate by including additional discussion and analysis of direct indirect and cumulative impacts to a variety of species groups (bivalves crustaceans soft corals etc.) Please provide references to support the discussion. Section: 3.5.2.3.2 PDF Page: 186 & 187 Comment: Please elaborate on the implications of route clearance for removing debris and bedforms prior to cable placement and the effects on benthic habitats. Depending on the bedform the disturbance may be minor or significant (such as elimination of the bedform). Section: 3.5.2.3.2 PDF Page: 187 Comment: Please provide a description of articulated pipes as a cable protection measure - this appears to be a new measure. Section: 3.5.2.3.2 PDF Page: 187 Comment: The impacts of cable placement in sensitive habitats such as SAV and shellfish reefs appears to be understated and minimized. Please elaborate on these impacts and effects including typical timeframes for recovery habitat conversion and effects on Essential Fish Habitat or Habitat of Particular Concern status (may be cross-referenced with the section on Finfish & EFH). Section: 3.5.2.3.2 PDF Page: 188 Comment: Supporting evidence is needed for the assertion that disturbance of sand waves sand shoals ridge and trough formations would be a minor impact and of short duration. Although bedforms are naturally dynamic features the time scale for the formation or breakdown of larger scale features is significant sometimes on the scale of decades or more. For example ripples and mega ripple may form move degrade over periods of weeks to years whereas sand shoals and ridge and trough complexes are formed move and degrade over decades to centuries. Excavations of sand borrow pits for beach nourishment often do not regenerate short-term. Additionally analysis has not been provided to explore the hydrodynamic alterations from WTG and OSS foundations and those effects on mobile bedform reformation.	Text was added to Section 3.5.2.4.1 to include that the risk of a spill from an offshore structure would be low and collisions and allisions are anticipated to be unlikely based on prevention factors. Project-specific COPs will address any proposed seabed clearance activities. At the programmatic level this can only be handled in an abstract, general way. Altering large bedforms is likely to have a greater impact than altering minor bedforms. Cable protection approaches include rock placement, concrete mattresses, frond mattresses, rock bags, and seabed spacers, according to the RPDE parameters provided in Table 2-2. Text has been edited. Horizontal directional drilling (HDD) methods would likely be used to install offshore export cables and avoid affected sensitive nearshore and intertidal habitats or seagrass beds. Trenchless installation would likely occur from an offshore punch-out location from the cable landing. Shoal habitats occur in high-energy environments and migrate in a generally southwest direction within the NY Bight area (Rutecki et al. 2014). Field testing of the recovery from sand removal of a total of 4,610,00 cubic yards (3,525,000 cubic meters) from Sandbridge Shoal, Virginia, concluded that sand dredging had no or no long-term impact on macrofaunal abundance. They stated, “It is likely that a combination of storm events, which periodically completely rework surface sediments, and benthic recruitment events, which when large and successful can structure surface sediments, are constantly shaping and reshaping the substrate” (Hobbs C. H., III. 2006. Field Testing of a Physical/Biological Monitoring Methodology for Offshore Dredging and Mining Operations. Marine Minerals Branch, Herndon, VA. Report No. MMS 2005-056. p.). The proposed activities would not remove sediment from the shoal, but would rather disturb it for cable emplacement. There is an ongoing BOEM-funded study to investigate these potential

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	Section: 3.5.2.3.2 PDF Page: 188 Comment: Please discuss the impact of DC cables on the natural geomagnetic field through resulting changes to EMF and the effects to benthic species. Section: 3.5.2.3.2 PDF Page: 189 Comment: Please provide examples of EMF impacts to invertebrate taxa rather than a generalization of negligible effects. Section: 3.5.2.3.2 PDF Page: 189 & 191 Comment: The section on Noise should be updated to include known values of noise production and sound dissemination from pile driving and other equipment. Section: 3.5.2.3.2 PDF Page: 190 Comment: The discussion on noise transmission and stress/behavior effects is broad and understated. Please elaborate further with a discussion of specific time scales definitions of 'proximity' and examples of stress-induced behavioral changes (bivalve opening/closure burial reduced feeding etc.). See for example Jzquel Y. Cones S. Jensen F.H. et al. Pile driving repeatedly impacts the giant scallop (Placopecten magellanicus). Sci Rep 12 15380 (2022). https://doi.org/10.1038/s41598-022-19838-6. Please elaborate on the anticipated differing effects if any based upon pile diameter hammer energy (especially in glauconite sands) and what 'local acoustic conditions' means. [Embedded Hyperlink: https://doi.org/10.1038/s41598-022-19838-6] Section: 3.5.2.3.2 PDF Page: 191 Comment: Please include a brief discussion of the current and proposed construction and/or expansion activities at ports referenced in this section. Section: 3.5.2.3.2 PDF Page: 192 Comment: Please provide a more thorough discussion of the anticipated hydrodynamic changes from the presence of structures and the effects on benthic resources. This should include a discussion on the consequences for benthic resources (larval transport effects food supply variability species distribution etc.). Please also provide evidence to support the statement that such disturbances are likely to be localized vary seasonally and have minor impacts as there appear to be numerous assumptions without support. Section: Global PDF Page: Comment: The above examples of improvements are also applicable to the subsequent sections on Alts	changes within the NY bight (https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/MM-20-01_2.pdf). Electric and magnetic field (EMF) levels from direct current (DC) cables above 50 milligausses (5.0 microteslas) would result primarily from exposed cable, which is not expected for offshore wind projects, and would occur close to (i.e., within 25 feet [7.6 meters] of) the cable. High voltage direct current (HVDC) cables can produce higher EMF levels, up to 207 milligausses (20.7 microteslas); however, this level was associated with shallower cable burial depths, and cables buried deeper under the seafloor would produce EMF closer to 4 milligausses (0.4 microteslas) (Hutchison et al. 2018). EMFs are discussed in Section 3.5.2.3 under cumulative impacts as other offshore wind farms are planned within the NY Bight. Newer references of studies on DC cables emitting EMF have been added. As other ongoing and planned offshore wind projects are set to take place within the NY Bight, several ports plan to expand, such as South Brooklyn Marine Terminal where Empire Wind 1 plans to make landfall, and a new O&M facility is proposed in Atlantic City, New Jersey, to support Atlantic Shore. These are some examples of port expansion projects that are generally referred to in Section 3.5.2.3.2 of the NY Bight PEIS. Refer to response to comment BOEM-2024-0001-0331-0037 for hydrodynamic changes. Text has been added to Section 3.5.2.3.2 to help characterize impact pile-driving noise, though the reader is referred to Appendix J, *Introduction to Sound and Acoustic Assessment*, for a more comprehensive description. Additionally, information from Jézéquel et al. (2022) has been incorporated into this section.

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	B and C and should be carried through in the discussions of impacts from one project 6 projects cumulative impacts and cumulative impacts with AMMMs.	
BOEM-2024-0001-0371-0016	Section: 3.5.2.4.1 PDF Page: 197 Comment: In addition to the discussion of invertebrate taxa recovery rates from sand mining operations please also include information on the recovery rates of the borrow areas themselves and discuss how this relates to the anticipated recovery of bedforms eliminated through the pre-sweeping process. When discussing the recovery rates of bedforms please more clearly distinguish the anticipated recovery based upon bedform type and size - large regional features (eg. ridge and trough formations) will not rebuild/recover on the same spatial or temporal scale as smaller ripples or mega ripples. Section: 3.5.2.4.1 PDF Page: 199 Comment: An example of where detail is needed per the Global comment above: "The predicted thermal effect is a small rise in temperature within a few centimeters of the cable." Please provide the predicted temperature increase. Section: 3.5.2.4.1 PDF Page: 200 Comment: Please elaborate on the relationship between WTG foundation type and noise transfer from the nacelle to the seafloor. What foundation type transfers the least noise? Is this the foundation type anticipated for use in the NY Bight? Section: 3.5.2.4.1 PDF Page: 201 Comment: Please provide supporting evidence that port expansion and redevelopment is expected to have negligible effects on benthic resources despite the likelihood of dredging filling bulkhead installation etc. Section: 3.5.2.4.2 PDF Page: 204 Comment: Please provide supporting evidence for the determination that the impacts from EMF cable heat survey gear utilization and port development would be negligible from 6 projects. Without supporting evidence it appears unlikely that full build out of 6 offshore wind farms in the NY Bight would result in undetectable impacts and effects from those IPFs. A substantially more robust discussion with supporting evidence is needed for the regional cumulative impacts and effects of these IPFs on benthic resources (flora fauna and bedforms) in the OCS nearshore and estuarine environments.	Refer to response to comment BOEM-2024-0001-0371-0015 for discussion of sand mining activities. Ports are typically very disturbed habitats, given the presence and movements of vessels from within the port. Therefore, although port expansion projects are anticipated, the benthic species within the port are accustomed to the disturbances. Mobile organisms would likely move out of the port, while sessile organisms would likely recover once the turbidity and sediment deposition pass. Text has been added to Section 3.5.2.4.1 to address cable heat in more detail. Survey gear utilization is a minimal impact as sampling stations are spaced out and the size of the collected samples is very small relative to the size of the WEA. Project-specific COPs will address this in more detail, and include details on the nearshore and estuarine environments once the export cable routes and landfall is proposed. Port improvement and expansion projects take place on a routine basis within heavily trafficked ports of New York and New Jersey. As stated above, the species that inhabit port environments are accustomed to disturbance and are likely to fully recover or temporarily move out of the area before or as a result of the disturbance. Activities associated with the proposed NY Bight projects included in the PEIS do not increase port impacts appreciably compared to background levels. Based on data from Tougaard et al. (2020), concrete foundations would produce the lowest sound levels during turbine operations (compared to steel monopile and jacket foundations). However, concrete foundations are often using in very shallow waters and would not be applicable for the WTG proposed for the NY Bight projects. Therefore, for the purposes of the PEIS, it was assumed that steel foundations, similar to those described for other approved offshore wind projects in this region, would be used for these NY Bight projects. However, during the project-specific COP NEPA analysis, developers will identify the specifics of their

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	Section: 3.5.2.5 PDF Page: 206 Comment: Please update the table of AMMMs to include a clear linkage between the measure proposed and the anticipated benefit to benthic resources. For example in BEN-2 it is not clear how requiring regular scour protection inspection avoids minimizes mitigates or monitors adverse impacts and effects to benthic resources. It would helpful for the reader to be told that the measure is considered avoidance minimization mitigation or monitoring.	proposed foundations and re-assess if a different material is proposed.
BOEM-2024-0001-0371-0017	Section 3.5.5. Finfish Invertebrates and EFH Section: 3.5.5 PDF Page: Global Comment: This EIS repeatedly states (for example section 3.5.5.5.2) that AMMMs would generally reduce impacts on finfish inverts and EFH but the impact determinations remain unchanged. Further the impact determinations remain unchanged between 1 and 6 project build-outs. The EIS is concluding that regardless of AMMMs adopted and regardless of projects constructed impacts will remain unchanged if that is the case then the AMMMs are not functioning as intended. Section: 3.5.5PDF Page: Global Comment: Repeatedly (for example section 3.5.5.5.5) this EIS identifies the presence of structures as the primary driver of major impacts. As a result we recommend developing and incorporating additional AMMMs in regards to the presence of structures.	BOEM has considered all comments on AMMM measures and has made several changes to address potential impacts on resources as provided in Appendix G and analyzed in Alternative C. Alternative C describes how impacts would be reduced with application of AMMM measures, but overall impact levels may not be reduced for all IPFs as impacts would still result from construction and O&M phases of project facilities. During project-specific COP NEPA analyses, additional mitigation measures can be considered for inclusion to address project-specific impacts.
BOEM-2024-0001-0371-0018	Section: 3.5.5.1.2 PDF Page: 266 Comment: Hydrodynamic conditions are important in determining habitat suitability within the region. More discussion about how hydrodynamic regimes in particular in regards to the Mid-Atlantic Cold Pool determine habitat suitability and influence species abundance and distribution across the GAA should be included. Section: 3.5.5.2 PDF Page: 275 Comment: (Table 3.5.5-5) Please ensure that the impact conclusions throughout this section are in alignment with the definitions provided. By the definitions provided any impact to a HAPC SAV included or complex habitat could never be considered minor since that would equate to an impact on 'sensitive habitats'. Additionally any habitat impact that is longer than 'short-term' could not be considered anything less than 'moderate'.	Additional information about the Mid-Atlantic Bight Cold Pool has also been included in Final PEIS Sections 3.4.2.1, 3.4.2.3, 3.5.2.4, and 3.5.5. *Impacts of the Proposed Action on Benthic Resource*s, under the Presence of structures IPF. Changes in cold pool dynamics resulting from future activities, should they occur, could conceivably result in changes in habitat suitability and fish community structure, but the extent and significance of these potential effects are unknown. Any impact on sensitive habitats is moderate at a minimum. However, per definition, minor impacts could be short to long term as could moderate and major impacts. Habitat areas of particular concern (HAPCs) (including SAV and complex habitats) are defined as subsets of EFH that provide important ecological functions or are especially vulnerable to degradation. No

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	Section: 3.5.5.3.1 PDF Page: 277 Comment: Please provide a citation to references that support the assumption that long-range migratory finfish would be precluded from many of the temporary and short-term impacts associated with offshore impacts as this appears to be based on numerous assumptions that lack support. Section: 3.5.5.4.2 PDF Page: 302 Comment: The discussion on the impacts from pile driving and subsequent exposure to noise focuses exclusively on the magnitude of decibel exposure from pile driving activities while omitting all discussion on duration of exposure. The duration of noise exposure is critically important in understanding cumulative impacts from pile-driving activities. This is particularly important in areas such as the GAA with longfin squid EFH as squid have short life and reproductive cycles and repeated noise exposure from pile-driving activities over the course of multiple years (and spawning seasons) could significantly degrade the quality of squid EFH available for spawning. Section: 3.5.5.4.2 PDF Page: 302 Comment: In the discussion on impacts from the presence of structures please include discussion on how the six proposed projects will impact the hydrodynamic regimes within the GAA. Specifically include discussion about potential impacts on the Mid-Atlantic Cold Pool and associated dependent species. Additionally this discussion should include analysis on the cumulative impact of the six projects in concert with the other regionally approved and expected projects on regional hydrodynamic regimes. Section: 3.5.5.4.5 PDF Page: 304 Comment: In the discussion on cumulative impacts of Alternative B; the conclusion states that impact rating could be decreased if construction of the NY Bight projects is staggered. Additional analysis and discussion of impacts and anticipated minimization (via staggered construction) on specific species and habitats should be included.	designated HAPCs are located within the NY Bight lease areas; however, summer flounder and sandbar shark HAPCs (Figure 3.5.5-2) may overlap with potential NY Bight offshore export cable corridors and vessel routes to the identified representative ports (see Chapter 2). RP MUL-23 includes avoiding cable emplacement in sensitive areas such as SAV habitat, and AMMM measures MUL-2 and MUL-27 include avoiding bottom interactions by enacting anchoring plans or using dynamic positioning (DP) vessels Based on their status as migratory species, this species group is not expected to be in a sustained habitat or location for a prolonged period of time. Research specific to noise impacts on squid was reviewed during the preparation of the Draft PEIS, and the discussion is included in the cumulative impacts discussion in the Impact and Vibratory Pile Driving section (Section 3.5.6.4.1) (research by Stanley et al. 2023 and Cones et al. 2022). The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. A discussion of uncertainty about the impacts of underwater noise is included in Appendix E. Future research will be incorporated into subsequent COP NEPA analyses as information becomes available. Discussion related to the current research on the potential impacts of the NY Bight projects on the Mid-Atlantic Bight Cold Pool is included in Section 3.5.5.4.2. Future project-specific COP NEPA documents will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. The timing of the construction of each of the six NY Bight projects is not known and depends on many factors outside the scope of the PEIS. As projects are developed, future project-specific COP NEPA documents may discuss potential overlaps in site development activity, if applicable.
BOEM-2024-0001-0371-0019	Section: 3.5.5.5.1 PDF Page: 307 Comment 1: Under the initial discussion on impacts from IPFs from Alternative C the text states that impacts would be reduced compared to Alternative B however the impact determinations (negligible to major) remains unchanged. Therefore either the text should be revised to say the impacts from	Through the utilization of the described AMMM measures, the quantity and extent of impacts related to the IPFs would be reduced; however, the identified AMMM measures would not completely remove or reduce these impact determinations.

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	the IPFs would not be reduced or further discussion must be provided on which impacts are being reduced and the impact determinations should be updated. Section: 3.5.5.5.1 PDF Page: 307 Comment 2: Under the initial discussion on impacts from IPFs from Alternative C the text identifies AMMMs BEN-1 MUL-4 MUL-12 and MUL-23 as the most effective at minimizing impacts on sensitive benthic and EFH resources however the AMMMs referenced lack any specific restrictions or parameters dictating the extent of adoption. Specific restrictions and parameters outlining the extent of adoption of each AMMM identified should be included to support this assertion. Section: 3.5.5.5.1 PDF Page: 309 Comment 3: Under noise - please include more discussion about the interaction between pile driving activities noise and presence of glauconite with each other. Section: 3.5.5.5.1 PDF Page: 310 Comment 5: Under Presence of Structures - The colonization of artificial hard bottom habitat created from project installation has the potential to be dominated by invasive species. This risk will be elevated in areas where Didendum vexillium is present and is fragmented across broad areas during sea bed prep activities (i.e. boulder relocation) for cable installation. Further the subsequent cable armoring will create novel hard bottom habitats for invasive species to spread and colonize along the cable corridors which may have been converted from unsuitable soft bottom habitat prior to installation. Cumulatively this could result in less resiliency to the spread of invasive species within the region. More discussion on the risks associated with habitat conversion fragmentation and invasive species spread should be included here. Section: 3.5.5.5.2 PDF Page: 310 Comment: This section describes the IPFs as being the same whether one or six projects are constructed however that fails to address how IPFs change and interact with each other cumulatively and introduce more regionally detectable impacts and mechanisms such as wind wake effects and the potential confounded associated ecological impacts. Further discussion and analysis should be added to describe these compounding IPFs and how they impact EFH finfish and inverts on a regional scale.	The measures are identified and described in Table 3.5.5-8. Details about the specific activities will be addressed during project-specific COP NEPA analysis. Text within Section 3.5.5.5.1 (page 3.5.5-42) has been enhanced to discuss the correlation between the presence of glauconite sand and the potential need to use increased level of hammer strike energy during pile-driving operation for WTG installation. Potential colonization by non-indigenous biota altering benthic or epipelagic communities is discussed in the *Presence of structures* subsection of 3.5.5.3.3. Thank you for your comment. Section 3.5.5.3.3 has been updated to include assessment of hydrodynamic effects of ongoing and planned offshore wind projects.

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BOEM-2024-0001-0371-0020	Section 3.5.6 Marine Mammals Section: 3.5.6 PDF Page: Comment: Note that due to workload this section did not receive a complete review by MMPA and ESA SMEs. Section: PDF Page: Comment: Please revisit all determinations for the NARW in each sub-section particularly Alternative C. The NARW has a small population size and therefore all impacts would be greater on this already at risk species. AMMMs decrease impact levels but in most cases cannot remove risk entirely so any negative impact to one individual may have population-level effects. This is not well represented throughout the section. Section: 3.5.6.1 PDF Page: 319 Comment: It is unclear how this list was made and how the species to include were decided upon. The paragraph states "species considered likely to occur in the NYB project area" however the previous table (3.5.6-1) lists relative occurrence in the offshore project area. The Sei Whale and the Atlantic White Sided Dolphin are included on the list but are both reported to be "Uncommon" in the project area by the table. Along the same lines the Short Finned Pilot Whale and Blue Whale are also reported as "Uncommon" are discussed later on in the section but are not included in the list. This is inconsistent and requires clarification. Section: 3.5.6.1 PDF Page: 320 Comment: Roberts revised the models in 2023 newer source now available; the most up to date version of the model should be used to inform the FEIS . Section: 3.5.6.1 PDF Page: 322Comment: Please add the BIAs identified by Van Parjis et al. 2015: BIAs for fin whale feeding have been identified off Rhode Island Sound between March and October and year-round for Georges Bank Cape Cod Bay and the Gulf of Maine BIAs for sei whale feeding have been identified from the Gulf of Maine to the continental shelf off Georges Bank between the months of March and November BIAs for minke whale feeding have been identified on Georges Bank in Cape Cod Bay and the Gulf of Maine between the months of Marchand November. Section: 3.5.6.1 PDF Page: 322 Comment: Please add that the NARW feeds primarily on Calanus spp. (Stone et al.1988; Kann and Wishner 1995; Woodley and Gaskin 1996). Also that Sei whales are often sighted in conjunction with right whales during the spring when they are both feeding on copepods. Section: 3.5.6.1 PDF Page: 325 Comment: Please add that	The sub-sections in Alternative C have been reviewed specifically for NARW, and based on available science BOEM concludes that no major effects on NARW would occur due to impacts of Alternative C. For additional information, please see response to comment BOEM-2024-0001-0371-0011. The species listed on page 3.5.6-7 are those likely to occur in the offshore project area defined in the first paragraph of Section 3.5.6, and text has been updated to denote: "The 14 species considered likely to occur in the offshore project area include" to be consistent with terminology. Additionally to maintain consistency, short-finned pilot whales and blue whales have been added to that list. Similarly, harp seals were added to the list. The newer information from Roberts et al. (2023) has been incorporated into the PEIS. Information about fin whale, sei whale, and minke whale Biologically Important Areas (BIA) has been added to Section 3.5.6.1.1 for ESA whales and 3.5.6.1.2 for non-ESA whales. Both the note about NARW preferred prey species and sei whales foraging in conjunction with NARW because they target the same zooplankton species has been added to Section 3.5.6.1.1. A note about the 2022 pinniped UME event in Maine between June and July 2022 based on the webpage last updated on April 23, 2024 (https://www.fisheries.noaa.gov/marine-life-distress/2022-pinniped-unusual-mortality-event-maine-closed) has been added to Section 3.5.6.1.2. The risk of GI tract injuries has been added to the discussion of potential non-auditory injuries in Section 3.5.6.1.3.

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	since June 2022 another UME for harbor and gray seals has been declared by NMFS off the southern and central coast of Maine with 322 seal strandings between June and December 18 2022 (NOAA Fisheries 2023). Preliminary testing has found some of the harbor and gray seals affected by the June 2022 UME to be positive for highly pathogenic avian influenza H5N1. Section: 3.5.6.1.3 PDF Page: 327 Comment: Please add that gastrointestinal injuries are also possible from explosive sources. (Reference: Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) (2017)- "The gas-containing organs (lungs and gastrointestinal tract) are most vulnerable to primary blast injury. ")	
BOEM-2024-0001-0371-0021	Section: 3.5.6.2 PDF Page: 334 Comment: The purpose of this table is unclear. Are these issues that are currently affecting marine mammals based on current trends? Please provide additional detail. In addition some impact indicators provide a level of impact for an issue while others describe how the issue is assessed. Water quality impact indicator for example lists how the issue is assessed. It seems that this is the more appropriate type of information to be stored in this table than what for example is provided for underwater noise. Please consider having each impact indicator in the same format. Also please define how seabed and water column alteration is different from habitat alteration. Section: 3.5.6.2PDF Page: 334Comment: The source provided for this table links to the recommendation for project pile driving sound exposure. That document does not discuss all issues provided in this table. Please update or provide additional sources.	The issues and indicators table in Section 3.5.6.2 has been revised in response to this comment. The footnote on the table is connected to the noise impact indicator source, not the source for the entire table.
BOEM-2024-0001-0371-0022	Section: 3.5.6.3.1 PDF Page: 335 Comment: It would be beneficial to include a more thorough analysis of each IPF relative to the No Action Alternative. Section: 3.5.6.3.3 PDF Page: 341 Comment: It would be beneficial to include more detail on intake/entrainment impact on plankton as it is a prey source for many marine mammals including the NARW. Section: 3.5.6.3.3 PDF Page: 341 Comment: More detail should be provided on EMF for HVDC cables as some are proposed in the GAA and (as stated) they emit 10 times more magnetic field than HVAC. Section: 3.5.6.3.3 PDF Page: 343 Comment: Entanglements can	Impacts of the No Action Alternative would be comparable to those discussed in Section 3.5.6.3.3 for the cumulative impacts, which provide a detailed discussion of each IPF. Additional information on intake effects for prey species for NARW has been added to Section 3.5.6.3.3 on page 3.5.6-30. Text in the discussion of survey gear utilization in Section 3.5.6.3.3 on page 3.5.6-32 has been updated to include the statement about any body parts/multiple body parts being affected.

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	occur on any body part as well as multiple body parts. Section: 3.5.6.3.3 PDF Page: 344 Comment: Please include that gear utilization from planned non-offshore wind activities could result in major long-term impacts for NARW if a NARW is entangled because impacts on individual NARWs could have severe population-level effects and compromise the viability of the species. Section: 3.5.6.3.3 PDF Page: 356 Comment: Please note that sound levels from wind turbine operations are likely to increase somewhat with increasing generator size and power ratings while the newer use of direct-drive technology is expected to lower underwater noise levels substantially. Section: 3.5.6.3.3 PDF Page: 356 Comment: Please provide sources for "researchers" as well as additional detail. Masking effects for what species? More information is necessary here. Section: 3.5.6.3.3 PDF Page: 359 Comment: Ocean Wind 1 has determined the cumulative impact of port utilization for the no action alternative is major for the NARW and moderate for other species. Ports discussed are very similar so it is unclear why NYB has determined the impact to be so much lower (minor for all species including the NARW). Please provide more detail or re-consider the impact determination. This also applies to subsequent Port Utilization sections. Section: 3.5.6.3.3 PDF Page: 359 Comment: Please review recent information/comments provided by NMFS on other OSW EISs and in Biological Opinions regarding effects of presence of structures and operations of WTGs. We consider this section to require updates to ensure that it reflects the best available scientific information (note that this comment is relevant to fish and sea turtles as well as marine mammal chapter) Section: 3.5.6.3.3 PDF Page: 359 Comment: Please add that an increase in offshore wind farms may weaken the regional thermocline and affect heat storage atmospheric CO_2 uptake and benthic resupply of oxygen gas (Dorrell et al. 2022). Section: 3.5.6.3.3 PDF Page: 360 Comment: "Tall vertical structures" are not the primary reason for the reduction of wind-driven mixing of surface waters. That would be energy extraction from the turbines. Section: 3.5.6.3.3 PDF Page: 361 Comment: Please provide a source that supports the claim that hydrodynamic effects will be limited to within 600 to 1300 feet down current of each monopile.	The discussion for gear utilization in Section 3.5.6.3.3 has been updated as requested to discuss non-offshore wind activities that would have major effects on NARW. Text in Alternatives B and C has also been checked to be consistent with this determination. The note about use of direct drive technology reducing sound levels even for larger turbine sizes has been added to the WTG noise discussion on page 3.5.6-48. This information comes from Lucke et al. (2007), and text has been updated to clarify that these are the researchers being referred to in the WTG operational noise masking discussion. The presence of structures discussion in Section 3.5.6.3.3 has been updated to include additional sources such as Jonhson et al. (2021), Floeter et al. (2022), Raghukumar et al. (2023), and NASEM (2023), and subsequent text has been updated to expand discussions as needed. The conclusion about thermoclines and heat storage from Dorrell et al. (2022) has been added to the discussion of the presence of structures in Section 3.5.6.3.3. Text in Section 3.5.6.3.3 referring to tall vertical structures has been updated as follows: "Human-made structures, such as bottom-founded foundations and operational WTG associated with offshore wind projects, alter local water flow…" The section has been updated with additional/newer references to clarify this range so this statement has been removed/replaced with results from Johnson et al. (2021) and Schultze et al. (2020).

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BOEM-2024-0001-0371-0023	Section: 3.5.6.4.1 PDF Page: 372 Comment: Please add that marine mammal species that are more likely to forage near the benthic organisms such as certain delphinids have more potential to experience EMF above baseline levels (Tricas and Gill 2011). Section: 3.5.6.4.1 PDF Page: 376 Comment: Please provide information on the possible behavioral responses from vessel noise such as the onset of avoidance behavior changes in acoustic behavior diving and subsurface interval behavior and changes in vocal rates (Southall et al. 2021). Section: 3.5.6.4.1 PDF Page: 376 Comment: The impact determined for G&G Survey Noise for Ocean Wind 1 with/including mitigation measures is minor. Please provide more detail as to how one NY Bight project without mitigation measures has a lower impact determination. Please apply this comment to all subsequent G&G Survey Noise sections as masking and behavioral responses are possible for all species as a result of this noise LFCs in particular. Section: 3.5.6.4.2 PDF Page: 382 Comment: Some of the IPFs included in this list as "expected to be minor" were determined to have a negligible impact not minor. Also not all of the IPFs had the same impact determination for each species/group such as the NARW. For example survey gear utilization while minor for other species was higher for the NARW. This summary is misleading.	The risk of EMF exposure increasing for benthic foraging marine mammals has been added as requested to Section 3.5.6.4.1. A full discussion of the potential behavioral responses to vessel noise is provided in Section 3.5.6.3.3 and referenced in Section 3.5.6.4.1 to reduce redundancy in the document. BOEM agrees with the point raised by this comment regarding impacts from geophysical and geotechnical (G&G) noise in Alternative B and has changed this to minor for all marine mammals. Masking and behavioral effects are discussed in detail in Section 3.5.6.3.3. Section 3.5.6.4.2 has been cross checked against Section 3.5.6.4.1 to ensure consistency with determinations.
BOEM-2024-0001-0371-0024	Section: 3.5.6.5PDF Page: 389Comment: (3.5.6-11) The first entry in the table for measure COMFIS-5 does not incorporate the redline edit reflected in the October 18 2023 DPEIS. It's missing the word "requiring." It should read "This measure proposes requiring during- and post-construction fisheries monitoring survey plan design follows the BOEM Fisheries Survey Guidelines." Section: 3.5.6.5.5PDF Page: 404 -405Comment: Here it reads impacts from one or six projects to mysticetes (including NARW) are expected to be "moderate for mysticetes (including the NARW) mainly resulting from UXO detonations and pile-driving noise because impacts would be noticeable and measurable and could result in population-level effects for some species;..." but it also reads that "For pile-driving BOEM expects impacts to be minor for non-NARW mysticetes..." Please verify the impacts from pile driving to mysticetes. Section: 3.5.6.5.5PDF Page: 404Comment: Alternative C: NMFS is concerned	COMFIS-5 has been reclassified as an RP. The cumulative impacts of Sub-alternatives C1 and C2 for NARW are expected to be major because serious injury or loss of an individual would result in population-level impacts that threaten the viability of the species if a vessel strike or entanglement were to occur. The proposed mitigation measures under Sub-alternatives C1 and C2 will eliminate the risk of Permanent Threshold Shift (PTS) for NARW due to UXO and impact pile-driving and will reduce the risk of vessel strikes such that the likelihood of one occurring is negligible. Because no PTS or vessel strike injuries are anticipated for NARW, no population-level effects are anticipated, and impacts were reduced from major to moderate.

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	with the impact determination for NARW as reduced from major from the No Action Alternative. Consistent with comments on OSW EISs if the status quo is expected to be major impacts for ongoing and planned activities no AMMM measures would reduce those impacts since they are tied to this proposed action. Therefore NMFS requests this be changed to major impacts for NARW. Additionally this is a different conclusion from what is in Table ES-2 and Chapter 2.	
BOEM-2024-0001-0371-0025	Section 3.5.7 Sea Turtles Section: 3.5.7 PDF Page: Global Comment: Note that due to workload this section did not receive a complete review by MMPA and ESA SMEs. Section: 3.5.7.1 PDF Page: 406 Comment: NMFS and USFWS have not designated DPSs for leatherback sea turtles because the species is listed as endangered throughout its global range (85 Federal Register 48332). 'Leatherback sea turtle Northwest Atlantic subpopulation' is more appropriate. Please also incorporate this change into table 3.5.7-1. Section: 3.5.7.1 PDF Page: 409 Comment: More recent AMAPPS survey data is available than 2017; please update the data and references in the FEIS. Section: 3.5.7.1 PDF Page: 410 Comment: Please add that visual sighting data may be limited because this small species is difficult to observe using typical aerial survey methods (Kraus et al. 2016) Section: 3.5.7.1 PDF Page: 410 Comment: Please add that Leatherback sea turtles dive the deepest of all sea turtles to forage and are more tolerant of cooler oceanic temperatures. In addition Please add that Bailey et al. 2012 found that oceanographic features such as mesoscale eddies convergence zones and areas of upwelling attracted foraging leatherbacks as these features are often associated with aggregations of jellyfish. Section: 3.5.7.1 PDF Page: 412 Comment: Please add that studies have indicated that the Mid-Atlantic Bight of the Atlantic OCS is an important a seasonal foraging ground for approximately 40000 to 60000 juvenile and adult loggerheads during summer months (NEFSC and SEFSC 2011). Section: 3.5.7.1 PDF Page: 412 Comment: Please add that sea turtles are wide-ranging and long-lived making population estimates difficult and survey methods vary depending on species (TEWG 200 NMFS and USFWS 2015). Because they have large ranges and highly migratory behaviors these factors can have impacts on individuals over broad	Text regarding the leatherback sea turtle population in Section 3.5.7.1 on page 3.5.7-1 has been updated to include the suggested recommendation, and Table 3.5.7-1 has been similarly revised as requested. The most recent Atlantic Marine Assessment Program for Protected Species (AMAPPS) reports have been reviewed and incorporated into this section where appropriate. A statement regarding difficulty in detection of Kemp's ridley sea turtles due to their size has been incorporated into Section 3.5.7.1. The requested leatherback information has been incorporated in Section 3.5.7.1. Loggerhead foraging information has been incorporated into Section 3.5.7.1. The following text has been added to the beginning of Section 3.5.7.3.1: "Because sea turtles have large ranges and highly migratory behaviors, these IPFs can have impacts on individuals over broad geographical scales. Therefore, in addition to the current conditions and trend of sea turtles in the geographic analysis area, these populations are also affected by factors beyond the geographic analysis area. However, the assessment in this PEIS focuses on those stressors currently present within the geographic analysis area, and any effects on the populations outside this region are considered as part of the species ongoing vulnerability affecting the species risk."

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	geographical scales. In addition the current condition and trend of sea turtles are also affected by factors beyond the geographic analysis area.	
BOEM-2024-0001-0371-0026	Section: 3.5.7.3.3 PDF Page: 424 Comment: It would be beneficial to include the estimated distances of planned export and inter array cables. Section: 3.5.7.3.3 PDF Page: 429 Comment: Please remove the phrase "dredging impacts on sea turtles are relatively uncommon" and begin the sentence after the semicolon. This statement is not descriptive and is misleading as written. Section: 3.5.7.3.3 PDF Page: 431 Comment: Please add that project decommissioning such as the removal of the monopile foundations and scour and cable protection would reverse the artificial reef effect provided by these structures and remove or disperse the associated biological community. Section: 3.5.7.3.3 PDF Page: 433 Comment: Please add that while sea turtles are capable of remaining submerged for long periods they appear to rapidly consume oxygen stores when entangled and forcibly submerged in fishing gear (Lutcavage and Lutz 1997).	The estimated areas for the planned export and interarray cables are provided in Appendix D, Table D2-2. The dredging statement for sea turtles was removed as requested. A statement about decommissioning effects reversing potential benefits has been added to Sections 3.5.7.3.3 and 3.5.7.4. A statement about sea turtles consuming oxygen stores when entangled was added to Section 3.5.7.3.3.
BOEM-2024-0001-0371-0027	Section: 3.5.7.4.1 PDF Page: 435 Comment: Please add that even though the impact of one NY Bight project "would be of low intensity short term and localized" ingestion of debris by a sea turtle can be fatal for the individual. Section: 3.5.7.4.1 PDF Page: 435 Comment: Please add that dredging could contribute additional impacts on sea turtles related to impingement entrainment and capture associated with mechanical and hydraulic dredging techniques. It would also be beneficial to discuss the different types of dredging that have the potential to be utilized for one project. Section: 3.5.7.4.1 PDF Page: 436 Comment: Please provide additional detail for explaining the negligible determination. Ocean Wind 1 determined the impact of EMF to be minor and that project proposed only HVAC. One NYB project has the potential to use HVDC which have considerably higher potential to adversely impact sea turtles than HVAC as stated. Section: 3.5.7.4.1 PDF Page: 442 Comment: Please add that periods of poor visibility or inclement weather would increase the collision risk for turtles because both turbid water and darkness would impede turtles' visual detection of approaching boats. Section: 3.5.7.4.1 PDF	Potential for fatal injuries due to ingestion of debris was added to the discussion in Section 3.5.7.4.1. Risk of impingement and entrainment due to mechanical dredging techniques was added in Section 3.5.7.4.1, as well as a summary of potential cable emplacement methods considered in this PEIS. Though EMF from HVDC is likely to be higher than high voltage alternating current (HVAC) cables, the potential impacts on sea turtles would still be limited to behavioral disturbances within a few feet from the cables due to the expected burial depth and more recent studies looking at HVDC effects on marine life. This negligible determination for one project in Alternative B is consistent with other recently published EISs, including Sunrise Wind and Empire Wind. A statement regarding increased vessel collision risk during poor visibility conditions for sea turtles has been added to Section 3.5.7.4.1. Requested information from the U.S. Navy Undersea Warfare Center has been incorporated into Section 3.5.7.4.1.

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	Page: 442 Comment: Please add surface information provided by the U.S. Navy Undersea Warfare Center's dive distribution and group size parameter reports (Watwood and Buonantony 2012; Borcuk et al. 2017). These data suggest that loggerhead and green sea turtles spend 60 to 75 percent of the time within 32 feet (10 meters) of the surface leatherback sea turtles spend about 20 percent of the time within 32 feet (10 meters) of the water surface and there are insufficient data to quantify Kemp's ridley sea turtle activity. Any sea turtle found in the geographic analysis area could thus occur at or near the surface whether resting feeding or periodically surfacing to breathe which is where they are at risk of vessel strike. Section: 3.5.7.4.2 PDF Page: 443 Comment: While the impact determination may not change it is inaccurate to equate the chance of accidental release for one project with that of six projects. Bejarano et al. 2013 modeled that a release of 2000 gallons or less is likely to occur every 5 to 20 years. The more turbines that are in the water the more fluid there is in each turbine and thus the higher the opportunity there is for a potential spill. Section: 3.5.7.4.2 PDF Page: 443 Comment: The statement that the likelihood of impacts are so low to be discountable contradicts the preceding section which describes impacts for each IPF not all of which were determined to be negligible. Section: 3.5.7.5.4 PDF Page: 458 Comment: AMMMs are implemented to mitigate adverse impacts. Therefore they lessen adverse impacts and do not create "greater beneficial impacts" as stated. Please fix.	The introduction to Section 3.5.7.4.2 states: "There would be more potential for impacts for these IPFs due to the greater amount of offshore and onshore development under six NY Bight projects. Impacts for accidental releases, discharges/intakes, EMFs and cable heat, survey gear utilization, and lighting are expected to be the same as those discussed above for one NY Bight project." Therefore, BOEM acknowledges an increased risk of oil spills due to the increased number of project infrastructure in the water column; however, the likelihood is still low, and BOEM does not anticipate that effects would combine such that the overall impact determination would increase from one project to six. The statement has been updated to clarify as follows: "…the overall likelihood of impacts resulting from these IPFs for any one project remains the same as described in Section 3.5.7.4.2 regardless of the number of NY Bight projects considered." The statement has been updated as follows: "Impacts on sea turtles are anticipated to be similar as described under Alternative B. While the application of not previously applied AMMM measures for six NY Bight projects can reduce potential adverse impacts, the impact level determination is not expected to change under Sub-alternative C2."
BOEM-2024-0001-0371-0028	Section 3.6.1 Commercial and Recreational Fisheries Section: 3.6.1 PDF Page: Global Comment: Please insert a reference to and a discussion of fisheries for highly migratory species (tunas sharks swordfish etc.) which are managed by NMFS's Highly Migratory Species Division. These fisheries are affected by this action but are not referenced in the baseline description other than in Table 3.6.1-1. Section: 3.6.1 PDF Page: Global Comment: Throughout the document particularly under cable emplacement and/or presence of structures please include a discussion of cable preparation activities and cable armoring including UXO detection and removal and boulder	The Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) includes Atlantic billfish, Atlantic tunas, swordfish, and sharks (NMFS 2006, 2017). HMS species are referenced in Section 3.6.1.1.4. as well as Table 3.6.1-1. General text about seabed preparation activities and cable protection were included under the cable emplacement and maintenance IPF in Sections 3.6.1.3.2 and 3.6.1.4.1. Details about the specific activities will be addressed during the project-specific, COP-level NEPA analysis.

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	relocation activities. Such activities are additional impacts that should be identified and considered in this document.	
BOEM-2024-0001-0371-0029	Section: 3.6.1.1.1 PDF Page: 479 Comment: (Table 3.6.1-1) Please ensure that this table includes all species affected by this action and managed by the management bodies listed. Many of the species managed by the ASMFC are not listed in this table (e.g. Atlantic menhaden striped bass Jonah crab etc.). Section: 3.6.1.1.3 PDF Page: 485 Comment: Please ensure that all commercial fisheries affected by this action are adequately described in this section including associated tables such as Table 3.6.1-6. Similar to previous project-specific EISs this section relies exclusively on data from vessels issued permits issued by the NMFS Greater Atlantic Regional Fisheries Office (GARFO). Operations in fisheries such as Atlantic menhaden and other ASMFC-managed fisheries HMS species and species managed by the South Atlantic Fishery Management Council are not well represented in the GARFO data presented in this section. As a result baseline evaluations of fishery operations throughout the six lease areas are underestimated in this DEIS. Further in several tables "all others" data are included in lease-specific reports available on our website but are not included in either the landings or revenue tables. Integration of data for these other fisheries into the FEIS would increase the likelihood that the programmatic EIS can meet BOEM's objectives. Section: 3.6.1.1.4 PDF Page: 514 Comment: (Figure 3.6.1-22) Please ensure that the "Prime Fishing Areas" identified by the New Jersey Department of Environmental Protection are included in this or a similar figure and discussed in the relevant text of this section. These areas include important fishing locations associated with bottom features that would be affected by this action. Evaluation of impacts to these areas including AMMMS to avoid such impacts should be included in the FEIS.	Species such as Atlantic menhaden, striped bass, and Jonah crab managed by the Atlantic States Marine Fisheries Commission (ASMFC) have been added to Table 3.6.1-1. Figure 3.6.1-22 has been updated to include the requested Prime Fishing Grounds data identified by the New Jersey Department of Environmental Protection (NJDEP).
BOEM-2024-0001-0371-0030	Section: 3.6.1.3.1 PDF Page: 516 Comment: Please describe current regional trends in stock biomass and fishery landings/revenues. Section 3.6.1.1 merely presents data without discussing trends in biomass or fishery operations. For example stock assessments could	While one NY Bight project is not anticipated to require port upgrades, some ports have planned improvements to accommodate offshore wind activities across the region, which are described in Appendix D. The impact determination is consistent

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	be referenced to describe biomass trends for important fishery species and patterns of landings/revenues could be described for the top fisheries. If this section concludes that such trends would continue it should summarize what those trends are. Section: 3.6.1.3.1 PDF Page: 518 Comment: Under anchoring please reflect the use of various anchoring techniques such as spud barges and jack-up vessels similar to the text in section 3.6.1.4.1 on page 3.6.1-47. Spud cans have been shown to result in long-term alteration of the bottom which could present operational impacts to mobile gear fishing unless filled in appropriately. Section: 3.6.1.3.1 PDF Page: 519 Comment: Under noise please include a discussion of vibrations transmitted through the foundation and into the seabed. Similar to noise sediment vibration has been shown to result in negative impacts to sessile species particularly shellfish which could have indirect impacts on associated fisheries. We have provided references to relevant scientific research in previous comments on project-specific EISs (OW1 Atl Shores South). Section: 3.6.1.3.2 PDF Page: 520 Comment: Under port utilization please revise impacts from “minor” to “moderate” to be consistent with impact level definitions in Table 3.6.1-17. Consistent with that table port utilization would disrupt fishery operations in affected ports and vessels would have to adjust somewhat for such disruptions over the long term and throughout the operational life of the project depending on the port. Thus port utilization would disrupt normal and routine functions of various fisheries operating out of affected ports and such impacts would be moderate. Section: 3.6.1.3.2 PDF Page: 520 Comment: Under presence of structures please summarize potential impacts to fishery landings and revenues impacted by ongoing projects to accurately characterize baseline impacts using the ongoing and planned projects listed in Table 3.6.1-19. This is similar to the approach for summarizing the landings/revenue exposed of the six leases affected by this action and can facilitate tiering by providing a more accurate baseline for the evaluation of the no action alternative and cumulative impacts. Such data are readily available in the NMFS reports referenced in this section.	with other EISs. More details and analyses will be included at the project-specific, COP-level NEPA analysis. Information about jack-up and spud barge effects has been included in the discussion of anchoring impacts in Section 3.6.1.3. Text has been added to address noise vibration to the seafloor and its potential effects, including recent studies on shellfish (scallop).

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BOEM-2024-0001-0371-0031	Section: 3.6.1.4 PDF Page: 522 Comment: Under anchoring please note that spud barges and jack-up vessels could leave long-term changes to the sea floor that could result in effects to fishing operations unless mitigated through the use of scour or fill. Section: 3.6.1.4 PDF Page: 523 Comment: Under cable emplacement please revise the impact conclusion to moderate instead of minor to be consistent with Table 3.6.1-17. If there are permanent impacts as noted remedial mitigation is needed to eliminate measurable effects. Thus impacts are more appropriately characterized as moderate per Table 3.6.1-17. Section: 3.6.1.4.2 PDF Page: 526 Comment: Under presence of structures please quantify the revenue exposure of fisheries that would be affected by development of wind projects in the six lease areas or reference the tables summarizing revenue exposure in previous sections. A quantitative evaluation of economic impacts for each lease area and the collective areas as a whole is possible along with the qualitative discussion provided herin. The data are available on our website (https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic- offshore-wind-development?utm_medium=email&utm_source=govdelivery) and should be incorporated into this DEIS. In a worst case scenario where all previous fishing activities would be displaced from the proposed lease areas historic revenue exposure could be used to assess potential impacts to commercial fishing operations under Alternative B absent any AMMMs. This would be consistent with an upper bound estimate of impacts found in conventional programmatic EISs and would facilitate tiering for future project-specific impact evaluations. Because the only data presented in this DEIS is from GARFO-permitted vessels such impacts would not be fully reflective of potential impacts to all affected fisheries and should be supplemented with additional sources for other affected fisheries. Also research by Changsheng Chen (https://tethys.pnnl.gov/publications/assessing-potential-impacts-offshore-wind-facilities-regional-sea-scallop-laval-early and https://s3.us-east-1.amazonaws.com/nefmc.org/Doc.14.a-UMASSD_WHOI_short_report_05_6_12_2021_revison.pdf) notes	BOEM has reviewed the impact determinations and found them to be consistent with other EISs. Further details will be provided during the project-specific, COP-level NEPA analysis. Revenue exposure cannot be quantified at the programmatic level, but will be addressed during the project-specific COP-level NEPA analysis. Chen 2021 has been cited in discussion about potential changes in larval distribution from the presence of structures.

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	that it is possible to estimate and evaluate oceanographic impacts on larval distribution. The results of that work and other similar research should be included in this section (or the no action alternative) as an example of the potential consequences to fishery resources and associated fisheries.[Embedded Hyperlink: https://s3.us-east-1.amazonaws.com/nefmc.org/Doc.14.a-UMASSD_WHOI_short_report_05_6_12_2021_revison.pdf)] Section: 3.6.1.4.3 PDF Page: 526 Comment: Please provide data such as cumulative fisheries revenue exposure tables and justification to support the conclusion that the six NY Bight projects when combined with other reasonable foreseeable actions would not "alter the overall state of commercial fisheries and for-hire recreational fishing." This section only includes qualitative general descriptions of potential impacts and does not attempt to quantify the cumulative impacts similar to how cumulative fishery impacts are assessed in project-specific EISs through cumulative revenue exposure tables. Such data are readily available to be integrated into the FEIS. To support the conclusions noted on this page and facilitate tiering of project-specific analysis additional information is needed even if such impacts would not change the overall qualitative impact ratings.	
BOEM-2024-0001-0371-0032	Section: 3.6.1.5 PDF Page: 528 Comment: Please include more detail describing how individual AMMMMs would avoid minimize mitigate or monitor impacts to commercial and for-hire fisheries or move this table below the supporting text that follows. Many of the proposed AMMMMs are not described in a manner that would identify how they relate to fishery operations and how they would avoid minimize mitigate or monitor fishery impacts. For example MUL-24 proposes an undefined adaptive management plan for NMFS trust resources to address as yet unknown issues or information rendering this AMMMM of minimal utility. Similarly MUL-5 proposes to use undefined equipment technology and best practices to reduce noise while MUL-26 proposes a generic environmental monitoring plan that could define mitigation and monitoring measures for all impacts to all resources affected by these leases. MUL-23 proposes adjustments to project design to minimize undefined impacts on environmental resources. However such adjustments are undefined and it is not	AMMM measures included in Alternative C in the Draft PEIS have been subcategorized into previously applied and not previously applied. In addition, some AMMM measures in the Draft PEIS are now recommended RPs for the Final PEIS; these RPs are not part of the Proposed Action. MUL-24 was removed from the Final PEIS based on comments received on the Draft PEIS. MUL-5, MUL-23, MUL-25, and MUL-26 are now recommended RPs for lessees to consider in their projects and can be found in Section 3.6.1.7. The table referred to in the comment is meant to be a summary of the AMMM measures for commercial fisheries and for-hire recreational fishing, and the full text of each AMMM measure is included in Appendix G.

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	likely that they could be made in a timely manner to avoid or minimize impacts to fishery operations given that many lessees have already proposed design parameters making project revisions later in the process (after final AMMMMs are defined through this action) costly and increasing the possibility for project delays. MUL-25 proposes consistent turbine grid layouts and at least one line of orientation spaced at least 1 nm apart. However individual lessees have already proposed different layouts and spacing even for adjacent leases while several do not include at least one line of orientation with turbines 1 nm apart which contradicts the purpose utility and efficacy of this AMMMM. The description of COMFIS-2 provides some detail that enables the reader to better understand how this measure would reduce impacts to fisheries. Additional detail of this nature or text similar to the descriptions of AMMMMs in Appendix G would help the reader understand how the AMMMMs could minimize impacts to fishery operations.	
BOEM-2024-0001-0371-0032-a	Section: 3.6.1.5 PDF Page: 528 Comment: (Table 3.6.1-20) Under COMFIS-1 please reference gear loss and damage compensation plans implemented in previous projects to maximize consistency and effectiveness of this AMMM. Absent further details it is possible that a lessee would implement a gear loss and damage compensation plan that would differ from previous measures implemented for approved projects which could cause confusion and increase burden on affected entities.	Thank you for your comment. COMFIS-1 is now an RP that recommends that lessees implement a gear loss and damage compensatory program and consult BOEM's draft guidance (https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf).
BOEM-2024-0001-0371-0032-b	Section: 3.6.1.5 PDF Page: 528 Comment: (Table 3.6.1-20) Under COMFIS-3 please provide additional detail about how such a monitoring plan would avoid or reduce impacts to scallop populations. We also recommend that a similar AMMMM be listed for other fishery populations that are affected by the lease areas particularly Atlantic surf clam and ocean quahog populations. Additional detail about the objectives of the monitoring plan and how/when it would be implemented is needed to evaluate its effectiveness. A monitoring plan would take time to develop execute and consider the results which would delay the implementation of any efforts to avoid or reduce impacts to scallop populations and	Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include the development and implementation of a Fisheries and Benthic Monitoring Plan.

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	targeted commercial fisheries. Given that many of the six NY Bight lessees have already proposed turbine layouts and spacing this AMMMM is unlikely to be effective at avoiding or reducing impacts because the resulting data may not be available in time to modify project proposals before the project is approved and construction would begin.	
BOEM-2024-0001-0371-0032-c	Section: 3.6.1.5 PDF Page: 528 Comment: (Table 3.6.1-20) Please include an AMMMM for fisheries operational monitoring program. COMFIS-5 proposes that lessees follow the Fisheries Survey Guidelines for monitoring. This guidance covers biological monitoring it does not cover fisheries operation monitoring. This would ensure impact evaluations are not exceeding what is anticipated and improve compensation mitigation by ensuring accurate predictions. NMFS staff may be able to provide technical assistance with the development of any fisheries operational monitoring program AMMMM	The suggested AMMM measure is beyond the scope of this PEIS and beyond BOEM's jurisdictional authority.
BOEM-2024-0001-0371-0032-d	Section: 3.6.1.5.1 PDF Page: 529 Comment: Please provide sufficient information to support and justify conclusions in this and subsequent sections (e.g. Section 3.6.1.5.4) that the proposed AMMMMs would reduce impacts on fisheries operations from all IPFs analyzed in Alternative B. While the additional discussion of how such AMMMMs relate to fishery operations and IPFs is helpful it is still unclear how such AMMMMs would eliminate the possibility of measurable effects and warrant changing impact conclusions from major to moderate. Even if measurable effects would be eliminated by the implementation of these AMMMMs this document does not guarantee that BOEM will require individual AMMMMs or all of these AMMMMs. Further the text in this section indicates that many would not affect impacts to fishery operations. As we have seen in previous projects the details of the compensation plans are needed to determine their effectiveness at mitigating income losses including whether all fishery operations are included in the compensation plan and eligibility requirements or limitations. Without additional detail including what actions each AMMMM may entail and when such actions would be taken (see comments above on specific AMMMMs)	Alternative C has been divided into two sub-alternatives: Sub-alternative C1 and Sub-alternative C2. Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus the AMMM measures that have not previously been applied. These AMMM measures that have not been previously applied may be less familiar to the offshore wind industry but could further avoid and minimize impacts on resources if applied. In addition, BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any previously identified AMMM measure that is an RP has been removed from Alternative C. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts on resources. AMMM measures from Sub-alternative C1 or C2, or a combination of both, may be required as conditions of approval for activities proposed by lessees in project-specific COPs

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	it is difficult to evaluate the effectiveness of most of the proposed AMMMMs. Text in Section 3.6.1.5.4 concludes that the cumulative impacts of Alternative C would continue to be major because some operations would experience substantial disruptions indefinitely even with AMMMMs. For consistency this section should differentiate how this action for the six lease areas based on the proposed AMMMMs would not result in a similar outcome.	submitted for the six NY Bight lease areas. BOEM may also require additional or different measures based on future, site-specific NEPA analysis of project-specific COPs. The overall impact rating conclusions (as shown in PEIS Table 2-4 and Executive Summary Table ES-2) may not always be different under Alternative C when compared to Alternative B, while impacts for specific individual IPFs may be different. Depending on the specific IPF and the resource analyzed, there can be notable differences that change the impact determination for a specific IPF under Alternative C. However, the overall impact rating conclusions for the resource encompasses all IPF impact conclusions. The details of the analysis for each IPF and the justification for the overall impact conclusion for a resource are found in the Chapter 3 resource sections.
BOEM-2024-0001-0371-0033	Section: App G PDF Page: 215 Comment: (Table G-1) Please consider addressing the Environmental Justice Issue described in Table 3.6.4-3 "Potential job and income losses due to disruption of ocean and coastal areas (e.g. commercial fisheries for-hire recreational fishing recreational fishing/tourism) or cultural disruption (subsistence fishing and tribal fishing)" as an AMMM explicitly. The language under EJ compensation (AMMM EJ-4) reads as if commercial and for-hire fisheries do not need to be considered/qualify under this measure with this description of this compensation program: "to address disproportionate and adverse impacts on EJ populations directly tied to OCS offshore wind activities as related to the impact analysis discussed in the COP-specific NEPA review [Bold Italics: that has not been addressed through another mitigation measure.]" The language for COM-FIS 6 AMMM addresses only lost revenue from fishing not loss of jobs cultural disruption or other social factors. Therefore there is a gap in mitigation measures to address this impact. Please clarify that the scope of this compensation plan would cover these social factors. If not please consider a measure that would address this through fair mitigation/compensation.	Refer to response to comment BOEM-2024-0001-0319-0004.

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BOEM-2024-0001-0371-0034	Section 3.6.7 Other Uses Section: 3.6.7.1.6 PDF Page: 678 Comment: If this is including surveys in the entire GAA as stated the Seal Abundance and Turtle Ecology Surveys should be included.	Text has been added to Section 3.6.7.1.6 accordingly.
BOEM-2024-0001-0371-0035	Section: 3.6.7.3.1 PDF Page: 682 Comment: Please provide detail to support the claim that impacts of the No Action Alternative would be of lower intensity than those described for the cumulative impacts. Section: 3.6.7.3.2 PDF Page: 686 Comment: Please add "in survey strata" after sampling. (...by precluding NOAA survey vessels and aircraft from sampling [Bold: in survey strata];) Section: 3.6.7.3.2 PDF Page: 687 Comment: Please add that this implementation strategy also defines stakeholders partners and other ocean users that will be engaged throughout the process and identifies potential resources for successful implementation through the duration of wind energy development in the Northeast U.S. region.	Text has been revised in Section 3.6.7.3.1 in the Final PEIS to remove reference to the No Action Alternative being of lower intensity. The suggested changes to Section 3.6.7.3.2 have been made.
BOEM-2024-0001-0371-0036	Section: 3.6.7.4.1 PDF Page: 691 Comment: Please change "could" to "would" as there is no uncertainty. (One NY Bight project [Crossout: could] [Bold: would] affect survey operations by excluding certain portions of the lease area...) Section: 3.6.7.4.3 PDF Page: 692 Comment: Consider structuring this section in the same format as section 3.6.7.4.1. The labeling of each section is beneficial. Section: 3.6.7.4.4 PDF Page: 694 Comment: Please add " as well as on the commercial fisheries community" after research. (...on fisheries and protected-species research [Bold: as well as on the commercial fisheries community].)	The suggested changes to Sections 2.6.7.4.1, 3.6.7.4.3, and 3.6.7.4.4 have been made.
BOEM-2024-0001-0371-0037	Section: 3.6.7.5 PDF Page: 695 Comment: (Table 3.6.7-6) Please add "to mitigate impacts at the project and regional level." This information is included in the full description of the measure in Appendix G but is omitted here in the summary. It would be beneficial to include in this section as well. Section: 3.6.7.5.2 PDF Page: 697 Comment: Mention of the impact of OU-7 for six projects is omitted from this section please add.	The suggested change to Table 3.6.7-6 has been made. Discussion of OU-7 has been removed from Section 3.6.7.5.2.
BOEM-2024-0001-0371-0038	Section: 3.6.7.1.5 PDF Page: 667 Comment: Comment from NOAA/NOS/IOOS: Please replace the 3 instances of the word	The suggested change has been made.

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	"SeaSonde" on this page with the word "oceanographic". SeaSonde is the product name of just one kind of oceanographic HF-radar manufactured by CODAR Ocean Sensors Ltd. There are other types of oceanographic HF-radars produced by other manufacturers within the New York Bight geographic analysis area too so an inclusive term should be used instead of calling out one specific radar make/model.	
BOEM-2024-0001-0371-0043-b	Section: 3.6.7.5 PDF Page: 695 Comment: Comment from NOAA/NOS/IOOS: In Table 3.6.7-6 the Measure ID #OU-1 and OU-5 should be combined into a single Measure OU-1 in accordance with the COP Terms & Conditions of other OSW projects that have only required a single measure to mitigate interference to oceanographic high-frequency radars (HFRs) in the NOAA IOOS HFR National Network. The updated language to use for that unified Measure Summary which reflects the language used for other OSW geographic analysis area is as follows:[Italic: "This measure proposes establishing a mitigation agreement with the NOAA IOOS Office to reduce interference of project activities with oceanographic high-frequency radar systems. Options to mitigate these effects include sharing near real-time telemetry of ocean surface current and wave data into the public domain via NOAA IOOS and sharing information about the operational state of each WTG."] Section: 3.6.7.5.1 PDF Page: 695-696 Comment: Comment from NOAA/NOS/IOOS: (1) In accordance with the prior comment about combining AMMM measures #OU-1 and OU-5 into a single measure please delete all references to OU-5.(2) In the paragraph on "Presence of structures" replace the following sentences on AMMM measure OU-1:"AMMM measure OU-1 could result in the reduction of impacts for SeaSonde radar systems as data sharing (i.e. turbine orientation and rate nacelle bearing angles and other information about the operational state of each turbine) between turbine and radar operators would allow for the turbine information to be included in the radar signal processing system leading to more accurate radar readings. Modifying existing SeaSonde radars systems with signal processing enhancements and antennae modifications would increase the accuracy of radar readings for ocean current data gathering (Colburn et al. 2020). Wind farm curtailment agreements	See response to comment BOEM-2024-0001-0371-0052.

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	identified under AMMM measure OU-1 require wind farms to cease operations during emergency circumstances which would further reduce radar interference. "with the following text which reflects just a single measure to mitigate interference to oceanographic high-frequency radars (HFRs) in the NOAA IOOS HFR National Network in accordance with the COP Terms & Conditions of other OSW projects:[Italics: "AMMM measure OU-1 would require an oceanographic high-frequency (HF) radar data interference mitigation agreement between the NY Bight lessee and the Surface Currents Program of NOAA's IOOS Office. The lessee in consultation with the NOAA IOOS Office would be responsible for determining if a project would cause HF-radar interference to a degree to which HF-radar performance is no longer within the specific radar systems' operational parameters or fails to meet NOAA IOOS's objectives. The mitigation agreement would provide surface current and wave measurements and only if necessary further information about the operational state of the WTGs to NOAA IOOS to ensure that any impacts on HF-radar systems are adequately mitigated thereby reducing impacts on these radar systems."](3) In accordance with the prior comments on combining AMMM measures #OU-1 and OU-5 into a single measure please delete the (now redundant) paragraph relating to AMMM measure OU-5 that reads as follows: "AMMM measure OU-5 would require a high-frequency data interference mitigation agreement between the NY Bight lessee and the Surface Currents Program of NOAA's IOOS Office. The lessee would be responsible for determining if a project would cause radar interference to a degree to which radar performance is no longer within the specific radar systems' operational parameters or fails to meet NOAA IOOS's objectives. The mitigation agreement would allow for NOAA IOOS to ensure that any impacts on NOAA IOOS's radar systems are adequately mitigated thereby reducing impacts on these radar systems."	
BOEM-2024-0001-0371-0044	Appendix A Section: A.2 and A.3 PDF Page: 3 – 10 Comment: Comment from NOAA ONMS: Appendix A Consultations and Coordination. The areas currently under consideration for the proposed designation of the Hudson Canyon National Marine	Thank you for your comment. Once the COP is submitted for OCS-0537, BOEM will coordinate with U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA) ONMS

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	Sanctuary will be directly adjacent to parts of the proposed lease areas. There are potential impacts to sanctuary resources during construction and installation for the project location OCS-0537. As such the NOAA Office of National Marine Sanctuaries (ONMS) should be a consulting agency.	related to the proposed designation of the Hudson Canyon National Marine Sanctuary as part of the COP NEPA EIS analysis.
BOEM-2024-0001-0371-0045	Appendix C Section: Appendix C: Tiering Guidance PDF Page: Global Comment: (Table C-1) It would be helpful for readers and provide greater guidance to the COP-specific NEPA analysis if BOEM included in this section a list of all anticipated COP-specific activities. Each "Impact Analysis" section in Table C-1 asserts that COP-specific NEPA analysis will include quantitative impact analysis based on the relevant IPFs associated with disturbance from each "offshore activity." Specific reference to all the anticipated offshore activities will provide greater guidance for what should be expected in the COP-specific NEPA analysis which will reference this programmatic.	Appendix C is intended to provide high-level information regarding the type of information BOEM anticipates could be incorporated by reference and the additional analysis that is expected at the COP-level NEPA. However, each COP will need to be evaluated to determine what type of activities are proposed and to what extent the PEIS can be incorporated by reference. BOEM is required to analyze each COP as proposed by the developer and does not make decisions on specific offshore activities unless the activities are included in the COP. Examples of COP-specific NEPA analysis can be found in the Final EISs for Empire Wind (https://www.boem.gov/renewable-energy/state-activities/empire-wind), Ocean Wind 1 (https://www.boem.gov/renewable-energy/state-activities/ocean-wind-1), Vineyard Wind 1 (https://www.boem.gov/renewable-energy/state-activities/vineyard-wind-1), Sunrise Wind (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind), and Revolution Wind (https://www.boem.gov/renewable-energy/state-activities/revolution-wind).
BOEM-2024-0001-0371-0046-a	Section: PDF Page: General Comment: Please include an AMMMM that requires the lessee to monitor changes to fishery operations within the lease area as a result of project-specific operations and the effectiveness of any fishery mitigation/compensation plans.	The suggested AMMM measure is beyond the scope of this PEIS and beyond BOEM's jurisdictional authority.
BOEM-2024-0001-0371-0046-b	Section: PDF Page: General Comment: Please include an AMMMM that requires the lessee to mitigate the social and cultural impacts to fishing communities associated with changes to fishing operations as a result of project-specific operations. This could include community development funds or other measures that could be combined with an AMMMM associated with fishery mitigation/compensation.	The proposed AMMM measure goes beyond BOEM's jurisdictional authority with regard to community development funds. Specific fisheries compensatory mitigation would occur at the project-specific COP NEPA review and consultations stage. Environmental Justice populations who fish are covered by other AMMM measures and RPs (see specifically EJ-1a and EJ-3).

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BOEM-2024-0001-0371-0046-c	Appendix G Section: PDF Page: General Comment: A "plan" is a detailed proposal for conducting actions or activities including how what where and when certain actions are being proposed how these actions were developed and decisions related to the actions were made. A plan or plans should be submitted during the regulatory/consultation processes for interagency review. "Reports" are accounts of actions that have been undertaken or observed; a report occurs after an action has taken place (or is underway). At present it is unclear how BOEM can evaluate the effectiveness of a plan at avoiding/minimizing impacts versus requiring substantive avoidance/minimizing of impacts via an AMMMM. Section: PDF Page: General Comment: Noting that a separate effort is underway to evaluate the AMMMs in the context of the planned framework programmatic ESA consultation and that we will be continuing to work with BOEM on the ones relevant to protected species and habitats in that context. Section: PDF Page: General Comment: A number of AMMMs appear to be "voluntary" or require the "consideration" (but not implementation) of planning that could avoid/minimize impacts. We recommend that these AMMMMs be modified to be required so that the effectiveness of these measures at avoiding/minimizing impacts can be analyzed. If they remain voluntary then the effects analysis must clearly indicate that the voluntary measure will have no effect on mitigating adverse effects. We recommend all AMMMMs be considered mandatory and as the introduction to this section states exceptions can be described and explained if "During NEPA review of individual COPs BOEM may identify AMMM measures that do not apply to a specific COP if it can be demonstrated that implementation is not warranted or effective." (p G-1) Section: PDF Page: General Comment: Please include an AMMMM that requires the lessee to monitor changes to fishery operations within the lease area as a result of project-specific operations and the effectiveness of any fishery mitigation/compensation plans. Section: PDF Page: General Comment: Please include an AMMMM that requires the lessee to mitigate the social and cultural impacts to fishing communities associated with changes to fishing operations as a result of project-	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as Terms and Conditions (T&Cs) or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs, and AMMM measures not previously applied as T&Cs. Regarding specific recommendations for new mitigation measures, monitoring changes to fishery operations is beyond the scope of this PEIS; mitigation of social and cultural impacts from project-specific operations occurs through fisheries compensatory mitigation (COMFIS-6), and there is one RP to encourage supporting compensatory funding (COMFIS-7). Note that COMFIS-1 (Compensation for gear loss and damage) was combined into COMFIS-6. BOEM continues to do research and understand potential socio-economic impacts of these projects. Avoidance of sensitive habitats, estuarine environments, and embayments during project activities such as plowing, trenching, and dredge material disposal will be determined at the project-specific stage in EFH consultations.

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	specific operations. This could include community development funds or other measures that could be combined with an AMMMM associated with fishery mitigation/compensation. Section: PDF Page: General Comment: Please include an AMMMM that requires construction activities such as plowing trenching and dredging avoid known sensitive habitats and features such as SAV shellfish NJDEP-designed prime fishing grounds etc. Section: PDF Page: General Comment: Please include an AMMMM that requires dredge material disposal activities avoid known sensitive habitats and features such as SAV shellfish NJDEP-designed prime fishing grounds wetlands etc. Section: PDF Page: General Comment: Please include an AMMMM that requires avoiding development/construction in estuarine environments and embayments.	
BOEM-2024-0001-0371-0046-d	Section: PDF Page: General Comment: Please include an AMMMM that requires construction activities such as plowing trenching and dredging avoid known sensitive habitats and features such as SAV shellfish NJDEP-designed prime fishing grounds etc.	Thank you for your comment. Avoidance of specific sensitive habitats will occur at the project-specific level consultations.
BOEM-2024-0001-0371-0046-e	Section: PDF Page: General Comment: Please include an AMMMM that requires dredge material disposal activities avoid known sensitive habitats and features such as SAV shellfish NJDEP-designed prime fishing grounds wetlands etc.	Thank you for your comment. Avoidance of specific sensitive habitats will occur at the project-specific level consultations.
BOEM-2024-0001-0371-0046-f	Section: PDF Page: General Comment: Please include an AMMMM that requires avoiding development/construction in estuarine environments and embayments.	Thank you for your comment. Avoidance of specific sensitive habitats will occur at the project-specific level consultations.
BOEM-2024-0001-0371-0047	Section: PDF Page: 210 Comment: BEN 1: Relocated boulders represent a permanent change to benthic habitat. Please include the effect of boulder relocation in the benthic habitat monitoring plan. Section: PDF Page: 210 Comment: BEN-1: NMFS recommends modifying this AMMM. In order to minimize impacts of boulder relocation on EFH boulders should be relocated to the periphery of the nearest delineated habitat of similar complexity and boulder density. It is unclear why minimization of relocation distance outside of the required relocation zone would equate to a minimized impact to EFH. Section: PDF Page: 210 Comment: BEN-1: Since lessees are	Thank you for your comment. Please refer to the response to comment BOEM-2024-0001-0439-0037. Minor edits have been made to BEN-1. A more detailed measure could be developed in the future as a result of project-specific information and consultations.

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	being instructed to avoid boulders please include in this AMMM measure that if avoidance is not possible the lessee must provide rationale why avoidance was not possible.	
BOEM-2024-0001-0371-0048-a	Section: PDF Page: 211 Comment: Under COMFIS-1 please consider referencing any boulders relocated as a result of project operations (e.g. cable emplacement and wind turbine installation preparation). Marked or unmarked bounders relocated as a result of the project construction activities can lead to gear loss and damage and associated reduction in fishery revenue. This impact should also be considered as part of this AMMM measure and not just be limited to manmade infrastructure components (e.g. mattresses cables turbines) owned by the lessee. We suggest editing the last sentence in the AMMM to read as follows: "For example the Lessee should consider compensation for damaged gear resulting from interactions between the fishing industry and non-marked/non-charted or marked/charted property (e.g. concrete mattresses) of the Lessee as well as gear damaged by charted and non-charted boulders that are relocated as result of project activities."	COMFIS-1 has been combined into COMFIS-6, Fisheries compensatory mitigation. AMMM measures BEN-1 and MUL-40 (previously NAV-1) also contain requirements for boulder avoidance, identification, relocation, and reporting. Nautical maps will be updated with the concrete mattress location. Cable, scour protections, and offshore wind infrastructure in general will all be charted.
BOEM-2024-0001-0371-0048-b	Section: PDF Page: 211 Comment: Please consider modifying COMFIS-3 or creating a new AMMM measure to include a monitoring program for other important fishery resources besides scallops located within the lease areas particularly Atlantic surf clam and ocean quahog resources. COMFIS-3 should also reference and be consistent with BOEM fisheries survey guidelines to the extent that they do not conflict with the intent and purpose of the AMMMM itself. Finally this should reflect and/or reference other similar AMMMMs such as COMFIS-5 and MUL-26.	Thank you for your comment. Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan, which includes Atlantic sur clam and ocean quahog. This plan includes fisheries and benthic resources generally. See response to comment BOEM-2024-0001-0371-0048-a for more information on the distinction between COMFIS-3, COMFIS-5, and MUL-26.
BOEM-2024-0001-0371-0048-c	Section: PDF Page: 211 Comment: COM-FIS-4 Fisheries Mitigation states that there is no anticipated enforcing agency because it is "voluntary". However this mitigation measure is critical as it effects the health safety and economic viability of individual operators who have historically used this area. This is an important AMMMM and should be enforced; it should not be a voluntary measure. Coexistence with existing uses including fisheries is a goal of both of	Thank you for your comment. Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of

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	our agencies with respect to offshore wind development but it would be increasingly limited without this AMMMM being enforceable.	the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. COMFIS-4 has been classified as an RP. Project-specific mitigation measures to reduce impacts will be considered at the project stage.
BOEM-2024-0001-0371-0048-d	Section: PDF Page: 211-212 Comment: COMFIS-4: Several of the static cable design elements and project design elements outlined in this AMMMM are crucial for reducing impacts and improving safety at sea. These planning elements should not be considered "voluntary"; NMFS recommends requiring lessees to provide explanations of their efforts to incorporate project and cable design elements; any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis as appropriate for review by BOEM. In addition NMFS recommends emphasizing the value of shared cable corridors where technically and economically feasible to minimize the total area disturbed. This will have benefits to commercial fisheries Essential Fish Habitat and other resources.	Thank you for your comment. MUL-18 (Shared transmission corridor) is an RP encouraging lessees to coordinate transmission infrastructure among projects.
BOEM-2024-0001-0371-0048-e	Section: PDF Page: 212 Comment: Under COMFIS-5 please clarify the relationship of this AMMM measure with other related AMMMMs such as COMFIS-3 and MUL-26. Language listed in MUL-26 should be incorporated into other similar AMMMMs such as this one when possible. It is important to note that unlike COMFIS-3 and MUL-26 compliance with this AMMMM and BOEM's survey guidance is voluntary. We recommend that all surveys conducted to support individual projects should be consistent with BOEM's guidance and the ROSA fisheries survey framework guidelines.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. COMFIS-3 is an AMMM measure requiring lessees to develop and implement a Fisheries and Benthic Monitoring Plan. COMFIS-5 (Fisheries Survey Guidelines) and BEN-3 (Benthic Survey Guidelines) are RPs that encourage the lessee to follow BOEM's existing guidelines when developing the monitoring plan. MUL-26 has been revised in response to comments received on

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		the Draft PEIS. MUL-26 (Coordination for regional monitoring and surveys) is an RP that is not meant to be a duplicate requirement. This RP now encourages coordination for regional monitoring and surveys.
BOEM-2024-0001-0371-0048-f	Section: PDF Page: 212 Comment: COMFIS - 5. NMFS continues to be concerned about the potential for some survey methods/gear types to result in interactions with protected species including the potential for lethal entanglement. We encourage BOEM to develop mandatory AMMMs that would ensure that fisheries surveys are undertaken in a way that minimizes such risk (e.g. avoiding gill nets utilizing ropeless/on-demand technology for trap/pot surveys) and ensures that necessary ESA and/or MMPA consultations/authorizations are in place prior to any such surveys that may affect protected species.	The Fishery Survey Guidelines (https://www.boem.gov/sites/default/files/documents/about-boem/Fishery-Survey-Guidelines.pdf) already account for use of ropeless technology, especially in proximity to protected species. In reviews for COP surveys with lessees and contractors, BOEM no longer supports the use of gillnets.
BOEM-2024-0001-0371-0048-g	Section: PDF Page: 212 Comment: COMFIS-6: The AMMM states "For losses to commercial and for-hire recreational fishermen the Fund must be based on the revenue exposure for fisheries." Exposure analysis does not cover all potential losses to fishing industry. Developers should be directed to analyze losses beyond historic fishing revenue within the lease areas ("revenue exposure") and work with fishing industry on potential monetary impacts beyond lost revenue - for example transit impacts and additional costs.	Thank you for your comment. Transit impacts and additional costs would come out through the claims process, not through the PEIS. Project details, such as design, will be analyzed during the COP NEPA stage. To the best of BOEM's abilities, development of corridors and transit access in lease and between leases to maintain fishing operations and vessel transit will be completed. BOEM is working with navigation subject matter experts and USCG to develop the corridors and transit access.
BOEM-2024-0001-0371-0049-a	Section: PDF Page: 216 Comment: MM-2 & MM-3: We recommend requiring real-time and long-term PAM monitoring plans that are submitted to BOEM BSEE and NMFS prior to implementation. The plan or plans could incorporate best practices as outlined by the RWSC. Also please consider requiring the use of passive acoustic receivers for acoustic telemetry as instruments to be included in the PAM monitoring plans (like STF-1 but required).	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. BOEM's review and revision of AMMM measures has resulted in MM-2 becoming an RP. MM-3 has been revised with additional details about long-term passive acoustic monitoring (PAM).

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BOEM-2024-0001-0371-0049-b	Section: PDF Page: 216 Comment: MM-5: We recommend adding NMFS as a federal agency to review and provide comments on a lessee's NARW Strike Management Plan (only BOEM and BSEE are listed in the Description).	Thank you for your comment. BOEM will continue discussions with NMFS. Further communication and coordination will occur at the project-specific stage.
BOEM-2024-0001-0371-0049-c	Section: PDF Page: 216-217 Comment: MMST-1: Please be consistent when naming the federal agencies that can review and provide comments on a submitted Alternative Monitoring Plan. Sometimes NMFS BOEM and BSEE are listed (in the Description) and other times only BOEM and BSEE are listed. In any location the agencies are named please consistently list NMFS BOEM and BSEE as the federal agencies that can review and comment on a submitted Alternative Monitoring Plan.	Thank you for your comment. BOEM will continue discussions with NMFS. Further coordination and communication will occur at the project-specific stage.
BOEM-2024-0001-0371-0049-d	Section: PDF Page: 220-221 Comment: MMST-12: We recommend requiring something similar to an Alternative Monitoring Plan for geophysical surveys similar to MMST-1 when surveys are conducted in poor sighting conditions or at night.	Thank you for your comment. MMST-12 has been updated to include information about an Alternative Monitoring Plan for geophysical surveys.
BOEM-2024-0001-0371-0049-e	Section: PDF Page: 221-222 Comment: MMST-14: We recommend requiring something similar to an Alternative Monitoring Plan for vessel strike mitigation similar to MMST-1 when vessels are transiting in poor sighting conditions or at night.	Thank you for your comment. MMST-14 was updated to include any construction, operations, or decommissioning vessel transits associated with the project. Please see revised AMMM measure in the Final PEIS for additional detail.
BOEM-2024-0001-0371-0050-a	Section: PDF Page: 226 Comment: MUL-19: Please indicate the duration of the cable monitoring. Recommend monitoring for the lifetime of the project.	MUL-19 has been revised to clarify that monitoring would occur every 3 years until projects are decommissioned.
BOEM-2024-0001-0371-0050-b	Section: PDF Page: 225 Comment: MUL-12: If ecological design elements are incorporated please include the design specifications as part of the benthic and fisheries monitoring plans.	Thank you for your comment. Details regarding ecological design elements are project-specific and will be analyzed at the subsequent COP NEPA stage if proposed as part of the COP.
BOEM-2024-0001-0371-0050-c	Section: PDF Page: 225 Comment: MUL-15: We have several recommendations for marine debris monitoring: Please include the development of a marine debris mitigation plan and note the duration for the marine debris monitoring; we recommend monitoring for the lifetime of the wind project. In addition to annually monitoring at least 10 of the WTGs located closest to shore we recommend that each WTG should be inspected by ROV divers or	MUL-15 has been deleted and incorporated into MUL-1 and now clarifies that surveying and reporting must occur for the first 3 years following COP approval and every 5 years thereafter. MUL-1 also clarifies that lessees may conduct surveys by remotely operated vehicles, divers, or other means, but any images or videos taken during the survey must be submitted with the annual

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	other means at minimum once every 3 years. The WTG marine debris monitoring plan should clearly explain how each WTG will be routinely inspected and results of these inspections can be presented in annual monitoring reports. Please include any gear markings in the monitoring reports which will be important for determining their provenance.	report. BOEM does not plan to require monitoring for 10 WTGs closest to shore at this programmatic stage.
BOEM-2024-0001-0371-0050-d	Section: PDF Page: 225 Comment: MUL-18: As noted in out comment on COMFIS-4 NMFS recommends emphasizing the value of shared cable corridors where technically and economically feasible to minimize the total area disturbed. This will have benefits to commercial fisheries as well as to minimizing impacts to benthic habitat and Essential Fish Habitat. Effort to incorporate these planning elements should not be considered "voluntary"; NMFS recommends requiring lessees to provide explanation of their efforts to incorporate project and cable design elements; any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis as appropriate for review by BOEM.	Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. MUL-18 is an RP. Additionally, Chapter 2 of the PEIS provides a discussion of transmission configuration options, and notes that transmission infrastructure may be developed, owned, and operated by either a transmission developer or a lessee. In the future, new projects may wish to coordinate with an existing project for purposes of running in parallel to existing infrastructure. BOEM regulations (30 CFR 585.200(b)) state, "A lease issued under this part confers on the lessee the rights to one or more project easements without further competition for the purpose of installing gathering, transmission, and distribution cables; pipelines; and appurtenances on the OCS as necessary for the full enjoyment of the lease." Although BOEM cannot limit a lessee's right to a project easement for submarine cables; BOEM can analyze in the project-specific COP NEPA documents the use of less impactful and/or shared cable corridors, where technically and economically feasible, to minimize resource impacts. Therefore, BOEM may condition COP approval of a project on the easement to an existing offshore transmission point of interconnection (POI).

Comment No.	Comment	Response
BOEM-2024-0001-0371-0050-e	Section: PDF Page: 223 Comment: MUL-2: Habitat data collected from the project should be used to develop all plans including the anchoring plan referenced in this AMMMM; these plans should be submitted as part of the regulatory/consultation processes. The developer should collected habitat data and assess how they will avoid/minimize benthic impacts from anchoring. As written this is a post-ROD measure and the effectiveness of this measure cannot be analyzed.	Thank you for your comment. Fisheries and Benthic Monitoring Plan details can be found in COMFIS-3.
BOEM-2024-0001-0371-0051-a	Section: PDF Page: 234-235 Comment: MUL-38: We recommend adding NMFS as a federal agency that can review and provide feedback on a lessee's noise mitigation plan.	Thank you for your comment. After additional consideration, BOEM has removed MUL-38. Should BOEM consider this at a later date, it will consider adding NMFS as a federal agency that can review and provide feedback on a lessee's noise mitigation plan.
BOEM-2024-0001-0371-0051-b	MUL-12: Where applicable ASGA supports the use of nature-inclusive design elements to possibly provide benefits to marine habitats over traditional materials.	Thank you for your comment.
BOEM-2024-0001-0371-0051-c	Section: PDF Page: 227 Comment: MUL-23: As described above this appears to be a voluntary AMMMM or requires "consideration" but not implementation. This AMMMM should be changed to require the avoidance of known sensitive habitats or features including SAV the Mid-Shelf Scarp NJDEP-designated prime fishing areas hard bottom etc. Additionally this AMMMM should include language regarding reducing a project's footprint within a lease area in order to avoid landscape-scale/large sensitive habitats or features.	Thank you for your comment. MUL-23 has been classified as an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0371-0051-d	Section: PDF Page: 227 Comment: Please consider revising MUL-24 to include TOYRs for non-protected species including important commercial and recreational species. TOYRs are useful at minimizing impacts to sensitive life stages of all NOAA trust resources especially larvae juveniles and spawning adults. Minimizing impacts to marine resources will also reduce indirect impacts to commercial and for-hire recreational fisheries and private recreational anglers.	Thank you for your comment. After further consideration, MUL-24 has been deleted because it is covered in other AMMM measures and through consultations.

Comment No.	Comment	Response
BOEM-2024-0001-0371-0051-e	Section: PDF Page: 227 Comment: MUL-24: It is unclear how this adaptive management plan will align with NMFS consultations. Please clarify how this intersects with the consultations and how NMFS would be consulted on this plan.	Thank you for your comment. After further consideration, MUL-24 has been removed.
BOEM-2024-0001-0371-0051-f	Section: PDF Page: 227-228 Comment: MUL-26: Please include in the monitoring plans efforts to evaluate the: effects of benthic habitat modification; effects of boulder relocations; effects of altered hydrodynamics; effects of ecological design elements if used; effects of impingement/entrainment at cooling water intake systems; thermal effects of water discharge at cooling water intake systems	MUL-26 has been revised in response to comments to encourage lessees to coordinate monitoring and survey efforts, meet regional data requirements and standards proposed by the Responsible Offshore Science Alliance (ROSA) and Regional Wildlife Science Collaborative (RWSC), and make results from monitoring publicly available. Additionally, MUL-23 has been classified as an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impact. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0371-0051-g	Section: PDF Page: 227-228 Comment: MUL-26: Please specify what the "other resource-specific monitoring plans" are in order to aid review of environmental monitoring plans. Baseline data collection should also be required as part of a monitoring plan.	MUL-26 has been revised in response to comments to encourage lessees to coordinate monitoring and survey efforts, meet regional data requirements and standards proposed by ROSA and RWSC, and make results from monitoring publicly available. Additionally, MUL-23 has been classified as an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs as they may further avoid and minimize impact. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0371-0051-h	Section: PDF Page: 229 Comment: MUL-30: If this AMMMM is meant to apply to both sea turtles and marine mammals please add marine mammals in to the description here; currently specifications only refer to protections for sea turtles. Or clarify that strike avoidance and shutdown zones during geophysical surveys to avoid impacts to marine mammals are covered in a different AMMMM.	MUL-30 was removed from the Final PEIS because it overlaps with MMST-12.
BOEM-2024-0001-0371-0051-i	Please include an AMMM related to avoiding construction activities during sensitive times of year for various species (time-of-year restrictions) such as migratory fishes (inshore/estuarine) longfin squid spawning (offshore/nearshore) winter flounder spawning/egg/larvae (estuarine) etc.	Time of year restrictions are determined at the project-specific stage through EFH consultation.
BOEM-2024-0001-0371-0052	Section: PDF Page: 235 Comment: In accordance with the prior comment on Section 3.6.7 about combining measures #OU-1 and OU-	The suggested revisions to the AMMM measure are too strict at this programmatic level review. This AMMM measure only

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	5 into a single measure replace the entry in the "Description" cell associated with Measure ID OU-1 with the following unified language (that has been previously applied as a COP Term & Condition) that was developed by the IOOS Surface Currents Program in consultation with NOAA's Office of General Counsel and provided to BOEM's Andrew McGuffin and team: [Italics: The Lessee will enter into a mitigation agreement with NOAA to mitigate operational impacts on oceanographic high-frequency (HF) radars including the following measures:1 HF-radar Interference Analysis and Mitigation. The Lessee's Project has the potential to interfere with oceanographic high-frequency (HF) radar systems in the U.S. Integrated Ocean Observing System (IOOS) which is managed by the IOOS Office within the National Oceanic and Atmospheric Administration (NOAA) pursuant to the Integrated Coastal and Ocean Observation System Act of 2009 (Pub. L. No. 111-11) as amended by the Coordinated Ocean Observation and Research Act of 2020 (Pub. L. No. 116-271 Title I) codified at 33 U.S.C. 36013610 (referred to herein as "IOOS HF-radar"). IOOS HF-radar measures the sea state including ocean surface current velocity and waves in near real time. These data have many vital uses ("mission objectives") including tracking and predicting the movement of spills of hazardous materials or other pollutants monitoring water quality and predicting sea state for safe marine navigation. The U.S. Coast Guard also integrates IOOS HF-radar data into its Search and Rescue systems. The Lessee's Project is within the measurement range of IOOS HF-radar systems. 1.1 Mitigation Requirement Due to the potential interference with IOOS HF-radar and the risk to public health safety and the environment the Lessee must mitigate unacceptable interference with IOOS HF-radar from the Lessee's Project. Interference must be mitigated before commissioning the first WTG or blades start spinning whichever is earlier and interference mitigation must continue throughout operations and decommissioning until the point of decommissioning where all rotor blades are removed. Interference is considered unacceptable if as determined by BOEM in consultation with NOAA's IOOS Office IOOS HF-radar performance falls or may fall	requires lessees to coordinate with radar operators for impact assessment. Analysis of project-specific design during subsequent COP NEPA analysis would be required to determine whether mitigation is required. BOEM has merged OU-1 and OU-5 with some minor revisions.

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	outside any of the specific radar systems' operational parameters or fails or may fail to meet IOOS's mission objectives. 1.2 Mitigation Review. The Lessee must submit to BOEM documentation demonstrating how it will mitigate unacceptable interference with IOOS HF-radar systems in accordance with the Mitigation Requirement. The Lessee must submit this documentation to BOEM (renewable_reporting@boem.gov) at least 120 days prior to commissioning the first WTG or blades start spinning whichever is earlier. If after consultation with the NOAA IOOS Office BOEM deems the mitigation acceptable the Lessee must conduct activities in accordance with the proposed mitigations. If after consultation with NOAA IOOS Office BOEM deems the mitigation unacceptable the Lessee must resolve all comments on the documentation to BOEM's satisfaction. 1.3 Mitigation Agreement. The Lessee is encouraged to enter into an agreement with the NOAA IOOS Office to implement mitigation measures and any such Mitigation Agreement may satisfy the requirement to mitigate unacceptable interference with IOOS HF-radar. The point of contact for the development of a Mitigation Agreement with the NOAA IOOS Office is the Surface Currents Program Manager whose contact information is available at https://ioos.noaa.gov/about/meet-the-ioos-program-office/ and upon request from BOEM. If the parties reach a mitigation agreement the Lessee must submit it to BOEM at renewable_reporting@boem.gov. The Lessee may satisfy its obligations under Section 1.2 by providing BOEM with an executed Mitigation Agreement between the Lessee and NOAA IOOS. If there is any discrepancy between Section 1.2 and the terms of a Mitigation Agreement the terms of the Mitigation Agreement will prevail. 1.4 Mitigation Data Requirements Mitigation required under Section 1.2 must address the following: • 1.4.1 Before commissioning the first WTG or blades start spinning whichever is earlier and continuing throughout the life of the Lessee's Project until the point of decommissioning when all rotor blades are removed the Lessee must make publicly available via NOAA IOOS near real-time accurate numerical telemetry of	

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	surface current velocity wave height wave period wave direction and other oceanographic data measured at the Lessee's Project locations selected by the Lessee in coordination with the NOAA IOOS Office.1.4.2 • 1.4.2 If requested by the NOAA IOOS Office the Lessee must share with IOOS accurate numerical time-series data of blade rotation rates nacelle bearing angles and other information about the operational state of each WTG in the Lessee's Project to aid interference mitigation. 1.5 Additional Notification and Mitigation • 1.5.1 If at any time the NOAA IOOS Office or an HF-radar operator informs the Lessee that the Lessee's Project will cause unacceptable interference to an HF-radar system the Lessee must notify BOEM of the determination and propose new or modified mitigation pursuant to Section 1.5.2 as soon as possible and no later than 30 days from the date on which the determination was communicated. • 1.5.2 If a mitigation measure other than that identified in Section 1.2 is proposed then the Lessee must submit information on the proposed mitigation measure to BOEM for its review and concurrence. If after consultation with the NOAA IOOS Office BOEM deems the mitigation acceptable the Lessee must conduct activities in accordance with the proposed mitigations. The Lessee must resolve all comments on the documentation to BOEM's satisfaction in consultation with the NOAA IOOS Office prior to implementation of the mitigation.] Section: PDF Page: 235Comment: Add a check to the cell [Italics: "Previously Applied as a COP Term and Condition" associated with Measure ID OU-1. This is in accordance with the prior comment about replacing the entry in this Measure's "Description" cell with language from previous COPs that unifies measures OU-1 and OU-5.] Section: PDF Page: 236Comment: [Italics: Delete the row of the table associated with Measure ID OU-5 once you have updated the entry for OU-1 according to comment immediately above. That comment provides text that combines OU-1 and OU-5 in line with what was	

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	done for other OSW geographic analysis areas so OU-5 may now be deleted]	
BOEM-2024-0001-0371-0053	Section: PDF Page: 237 Comment: Please include AMMM measures that address private angler recreational fishing effects. For example private angler fishing seasons especially in NY and NJ go beyond the Rec-1 AMMM seasonality of Memorial Day to labor day. Key recreational species such as striped bass are important to private anglers fishing offshore and marinas and bait and tackle shops and the season extends through the fall into November. Please see the following resources from Hurricane Sandy in NY/NJ for economic impact of disruptions to bass species' prime fishing seasons. https://www.st.nmfs.noaa.gov/Assets/economics/documents/sandy/social-econ-hurricane-sandy.pdf[Embedded Hyperlink: https://www.st.nmfs.noaa.gov/Assets/economics/documents/sandy/social-econ-hurricane-sandy.pdf] Section: PDF Page: 237Comment: Please include AMMM measure that addresses avoiding and mitigating impacts to public fishing access sites that may overlap with onshore offshore wind infrastructure. These sites are not only important for recreation and tourism but minority populations and/or subsistence fishing. Public fishing site register can be found here: https://www.fisheries.noaa.gov/recreational-fishing-data/public-fishing-access-site-register. Some states also have databases on public fishing sites/locations [Embedded Hyperlink: https://www.fisheries.noaa.gov/recreational-fishing-data/public-fishing-access-site-register]	Thank you for your comment. COMFIS-6 requires that lessees establish a compensation/mitigation fund that includes for-hire recreational fishermen. Further discussions about fisheries compensatory mitigation will happen at project-level COP stage and consultation. Project-specific information such as onshore infrastructure that supports offshore wind and its proximity to public fishing access sites can be analyzed in the COP NEPA analysis.
BOEM-2024-0001-0371-0054	Section: PDF Page: 237 Comment: ST-2: Please note that the website https://seaturtlesightings.org/ is only for sea turtles in the New England region. This can be monitored for situational awareness particularly when vessels are traveling to and from New England. Section: PDF Page: 237Comment: STF-1: We recommend making this a requirement as opposed to voluntary. Understanding movement / mixing rates for fish stocks will become important for fisheries stock assessments with development of offshore wind farms. Also consider incorporating this into monitoring plans where sampling designs can be developed to ensure adequate and consistent sampling coverage.	Thank you for your comment. BOEM has reviewed STF-1 and determined it will remain as an RP. ST-2 has been incorporated into MMST-14 and removed from the Final PEIS.

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	For example broader tagging studies should be part of monitoring plans to assess changes in species assemblages.	
BOEM-2024-0001-0371-0055	Additional Comments Section: PDF Page: Global Comment: Climate change is discussed throughout the document but not in the context of being an IPF which is not consistent with other EISs. Further climate change is identified as an IPF in BOEM's "National Environmental Policy Act Documentation for Impact-Producing Factors in the Offshore Wind Cumulative Impacts Scenario on the North Atlantic Outer Continental Shelf" and other EISs. Please either incorporate it as an IPF throughout the document or provide additional explanation for why climate change is not considered an IPF for this PEIS.	Thank you for your comment. In the NY Bight Final PEIS, BOEM analyzed potential climate change impacts on each resource as a part of the ongoing and future conditions under the No Action Alternative. The IPFs identified and analyzed in the NY Bight Final PEIS are directly associated with potential development in the NY Bight lease areas.
BOEM-2024-0001-0371-0056	Section: PDF Page: Global Comment: Comment from NOAA ONMS: The areas currently under consideration for the proposed Hudson Canyon National Marine Sanctuary are directly adjacent to parts of the proposed lease areas. There are potential impacts to sanctuary resources during construction and installation for the project location OCS-0537: high frequency noise and short term impacts from drilling and pile driving turbine construction; after construction there could be low frequency impact over the long term use of turbines in proximity to the sanctuary. Section: PDF Page: Global Comment: NOAA ONMS: Due to the proximity of the lease areas to the areas currently under consideration for the proposed Hudson Canyon National Marine Sanctuary it would be of benefit to require as a condition of any COP Approval notification to the NOAA ONMS and the Hudson Canyon Sanctuary Superintendent should there be any accidents and/or releases into the environment that could have the potential to impact Sanctuary resources.	BOEM will coordinate with NOAA on the status of the marine sanctuary and consider such measures at the COP-specific NEPA stage.
BOEM-2024-0001-0371-0057	Section: PDF Page: Global Comment: Marine mammal impact determinations are inconsistent throughout the document (ES Chapter 2 Chapter 3) and we request BOEM do a QC for consistency. Section: PDF Page: Global Comment: NMFS requests that everywhere impact statements currently read "non-NARW species" it specifies if the impact statement is specific to non-NARW mysticetes or to all marine mammal species.	This section, the Executive Summary, and Chapter 2 have been reviewed to ensure consistency in the impact determinations for marine mammals.

P.4.2 Cooperating State Agencies

P.4.2.1 New Jersey Department of Environmental Protection

Table P.4-7. Responses to Comments from the New Jersey Department of Environmental Protection (BOEM-2024-0001-0448)

Comment No.	Comment	Response
BOEM-2024-0001-0448-0001	Marine Resources Administration Although New Jersey's Marine Resources Administration (MRA) supports the Proposed Action (Alternative C), *The adoption of programmatic avoidance minimization mitigation and monitoring (AMMM) measures that the Bureau of Ocean Energy Management (BOEM) may require as conditions of approval for activities proposed by lessees in Construction and Operations Plans (COPs) submitted for the six NY Bight lease areas*, BOEM should consider the feasibility and effectiveness of each measure being recommended. MRA understands and supports that if the COP-specific National Environmental Policy Act (NEPA) analysis shows that implementation of such measures is not warranted or effective that BOEM may require additional or different measures based on the subsequent site-specific NEPA analysis. The purpose of the Proposed Action is to identify issues, analyze the degree of potential impacts and adopt, as appropriate, AMMM measures. Two goals of the PEIS are analyzing potential impacts if development is authorized in the six NY Bight lease areas and analyzing programmatic AMMM measures for the six NY Bight lease areas. The MRA agrees that the BOEM-selected AMMM measures would be applicable to more than one NY Bight lease area are reasonable and enforceable and allow for flexibility where appropriate. Adoption of programmatic AMMM measures in the first-tier analysis while allowing for additions removals and revisions of these measures as appropriate in the individual second tier Environmental Reviews will help to spread out the effort for stakeholders who review these long and complex documents. This approach should also allow for incorporation of novel mitigation measures as they are developed that respond to the site-specific needs of the unique projects and locations. This tiered approach will facilitate consistency in reviews across projects provide some	BOEM acknowledges New Jersey's Marine Resources Administration's support of Alternative C. BOEM has considered all comments received on AMMM measures and made adjustments to the AMMM measures based on comments as presented in Final PEIS Appendix G. In the selection and analysis of AMMM measures, BOEM considered the feasibility and effectiveness of each measure.

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	predictability reduce impacts to coastal resources and facilitate cooperation between projects.	
BOEM-2024-0001-0448-0002	As stated in Appendix G of the Draft Programmatic Environmental Impact Statement (PEIS) monitoring is critical to evaluating resources impacts and the effectiveness of AMMM measures. The introduction to Appendix G identifies how results may be used specifically "to (1) alter how an AMMM measure identified in the ROD is being implemented (2) revise or develop new mitigation or monitoring measures for which compliance would be required under the COPs for the six NY Bight lease areas (3) develop measures for future projects or (4) contribute to regional efforts for better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g. potential cumulative impact assessment tool)." This list highlights the importance of adaptive mitigation and is helpful in understanding why monitoring coordination of monitoring and accessibility of results is so important. Monitoring can only be used in these applications if monitoring is designed to answer scientific questions and results are made available and accessible as soon as possible. There should also be a mechanism identified for reviewing monitoring results in the context of each of these uses. The document might benefit from clarification of the overall goal for mitigation and how individual AMMMs are assessed. One might assume that a goal is to reduce impacts to the level of the no action alternative but that is not practical for marine fisheries since the no action alternative for fisheries has a major impact. It's also difficult to understand the value of individual mitigation measures on the affected environment. It seems reasonable to employ any practicable mitigation measure that reduces impacts without affecting the viability of the project not just those that alter the assessment of the impact for the resource with the very broad scale that is used.	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMMs that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. Overall, BOEM strives to take an adaptive approach to assessing impacts when the Project Design Envelope (PDE) is known and requiring mitigation measures.
BOEM-2024-0001-0448-0003	Mitigation regarding collection of information needed for understanding fishery impacts is described in COMFIS-5 Fishery Survey Guidelines. MRA recommends that this AMMM measure is broadened to include (1) a recommendation to participate in ongoing efforts to standardize and economize project-specific and regional	Thank you for your comment. MUL-26 has been revised in response to comments to encourage lessees to coordinate monitoring and survey efforts, meet regional data requirements and standards proposed by ROSA and RWSC, and make results from monitoring publicly available.

Comment No.	Comment	Response
	fisheries monitoring and research and (2) a recommendation that all fishery monitoring results are accessible as soon as practicable to stakeholders. Regional entities (e.g. the Responsible Offshore Science Alliance and the Regional Wildlife Science Consortium) have taken on the task of prioritizing standardizing and coordinating monitoring and supporting data governance across projects and this AMMM should also address the need for participation of lessees in these efforts.	
BOEM-2024-0001-0448-0004	Regarding specific resource-monitoring recommendations MRA recommends that Lessees develop an Atlantic surf clam monitoring plan. AMMM COMFIS-3 recommends that Lessees coordinate with NMFS and potentially impacted scallop fishermen to develop a Scallop Monitoring Plan. New Jersey's highly valuable surf clam industry could lose 15% of revenues to offshore wind and the Atlantic City NJ fleet could lose upwards of 25%[Footnote 1: Munroe D.M. Powell E.N. Klinck J.M. Scheld A.M. Borsetti S. Beckensteiner J. and Hofmann E.E. 2022. The Atlantic surf clam fishery and offshore wind energy development: 1. Model development and verification. ICES J. Mar. Sci. 79(6) 1787-1800.] [Footnote 2: Scheld A. M. Beckensteiner J. Munroe D. M. Powell E. N. Borsetti S. Hofmann E. E. and Klinck J. M. 2022a. The Atlantic Surf clam Fishery and Offshore Wind Energy Development: 2. Assessing Economic Impacts. ICES Journal of Marine Science 79 (6): 180114.]. Losses of these magnitudes and localized overfishing could have cascading impacts on secondary industries. Additionally a complicating factor is the shifting of the surf clam population north and east so using only existing data to evaluate the surf clam resources within the lease areas may severely underestimate the value of the stock. Surveys directed towards a broad age class of surf clam and ocean quahog will inform mitigation. The AMMM measures for Commercial Fisheries include other specific recommendations for mitigating impacts including reducing the risk of cable interactions reducing alteration to the seabed avoiding sensitive habitats use of nature-inclusive design charting obstructions AIS marking navigation training and reducing the size of the area of impact. For example AMMM measures COMFIS-2 and AMMM COMFIS-4 recommend scour protection that reduces the risk of creating new hangs to mitigate impacts to the use of mobile bottom	Thank you for your comment. Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan, which includes Atlantic surfclam.

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	gear. As new information and technologies become available MRA looks forward to the availability and utility of additional mitigation measures for individual COPs. The recommendation to use shared cable corridors when possible in AMMM COMFIS-4 recognizes the importance of reducing the area of impacts and supports minimizing impacts to the abundant prime fishing areas identified by our state.	
BOEM-2024-0001-0448-0005	AMMM COMFIS-4 sets a minimum cable burial depth of 3 feet. It should be noted that shallower depths would be inconsistent with New Jerseys enforceable policies as the policies are likely to require 6 feet of burial depth in the near future. Projects installing cables within New Jersey state waters will have to comply with burial depths outlined in our rules and regulations at the time of permitting. MRA notes that a burial depth of 2m minimizes the risk of an anchor from a commercial fishing vessel contacting a cable[Footnote 3: Sharples M. 2011. Offshore Electrical Cable Burial for Wind Farms: State of the Art Standards and Guidance & Acceptable Burial Depths Separation Distances and Sand Wave Effect Bureau of Ocean Energy Management Regulation and Enforcement Offshore Electrical Cable Burial for Offshore Wind Farms on the OCS. https://www.bsee.gov/sites/bsee.gov/files/tap-technical-assessment-program//final-report-offshore-electrical- cable-burial-for-wind-farms.pdf] reduces the risk of a hydraulic clam dredge interacting with the cable4 and provides more reduction in EMF between the cable and the seafloor. NJ's Third Offshore Wind Solicitation required HVDC-based cable and converter technology and future solicitations for Projects that will utilize NJ's Prebuild Infrastructure will also require HVDC technology. Deeper burial can reduce the higher risk of EMF effects3 of HVDC compared to HVAC.	Thank you for your comment. Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. BOEM has classified COMFIS-4, Fisheries mitigation, as an RP.
BOEM-2024-0001-0448-0006	The MRA supports the measures described in COMFIS-6 regarding fisheries mitigation and the requirement for projects to establish a fund to compensate commercial and for-hire recreational fishermen for loss of income resulting from displacement from fishing grounds due to project construction and operations._It should be a requirement not just a recommendation that the fund is sufficient to allow compensation to shoreside businesses for losses indirectly	Thank you for your comment. COMFIS-6, Fisheries compensatory mitigation fund, should also allow for compensation to shoreside businesses for losses indirectly related to project development. Revenue exposure data compiled by NOAA/NMFS attempts to capture both commercial and party/charter information. In current T&Cs, these data are the minimum basis for Direct Compensation Program funding. BOEM anticipates that shoreside

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	related to project development. Recognizing the importance of sustaining fisheries and the fishing industry eleven east coast states have developed a detailed description of the need design and development of a trusted Regional Fund Administrator (RFA) for managing and distributing fisheries compensatory mitigation funds for offshore wind in a transparent and equitable manner. BOEM should recommend that lessees utilize and contribute to the Regional Compensation Fund once it is established.	service expected exposed revenue be based off a multiplier on the commercial and for-hire recreational fishing revenues to ensure proper funds are available. However, it should be incumbent upon the shoreside business or service to verify its loss. Additionally, a new RP (COMFIS-7) was created in response to comments to encourage lessees to participate in the Fisheries Compensation Fund. BOEM does not preclude the lessees of the NY Bight from using a regional fund administrator, provided the requirements set forth by BOEM are met. BOEM recognizes the advantages of a single fund, yet also recognizes that a lessee may prefer to better set the terms of a fund for its individual project.
BOEM-2024-0001-0448-0007	The MRA recognizes NOAA Fisheries as the lead agency for the protection of marine mammals and turtles and supports any recommendations provided by that agency regarding potential impacts and mitigation measures. MRA appreciates the strides that BOEM and NOAA have made towards coordinating passive acoustic monitoring in the Mid-Atlantic Region and coordination will continue to advance for these and other resources. Additionally the NJ Research and Monitoring Initiative supports these efforts and has plans to fund the deployment of PAM receivers off our coast that complement the work of other agencies and developers. Regional coordination should be expanded to include aerial surveys.	Thank you for your comment. BOEM may consider expanding regional coordination for aerial surveys. MUL-26 was updated to encourage coordination for regional monitoring and surveys.
BOEM-2024-0001-0448-0008	Land Resource Protection The Division of Land Resource Protection commends BOEM for including references to state specific jurisdictions. The NJDEP will continue to review and permit projects that are within the boundaries of New Jersey State waters and lands. The document outlines that WTGs and OSSs would be mounted on one or a combination of the following foundation types: monopile piled jacket suction bucket (could be mono-bucket suction- bucket jacket or tri-suction pile caissons) or gravity-based foundations (Figure 2-3 through Figure 2-6). Monopile and piled jacket are anticipated to be the most likely foundation types to be used for the NY Bight projects. The possible use of "floating foundations" as a mounting method was not discussed and should be further considered by BOEM. This method	The analysis in the PEIS is based on parameters of a representative project—the RPDE as described in Section 2.1.2.1—which includes multiple potential foundation options as identified with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. Floating foundations were not identified during the development of the RPDE as being a potential foundation type considered in the NY Bight area. The NY Bight area has relatively shallow seabed depths and is suitable for fixed foundations. Floating foundations are a newer technology that is being considered in areas with deeper water, including offshore California and in the Gulf of Maine. The PEIS includes AMMM measures (see Appendix G) to minimize seabed disturbance

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	may reduce the impact to many of the biological resources outlined in chapter 3.5.	impacts and other aspects of foundation installation. During project-specific COP NEPA reviews, BOEM will consider project-specific alternatives to avoid and minimize impacts.
BOEM-2024-0001-0448-0009	Endangered Nongame Species Program According to the DPEIS a study indicated that abandoned or lost fishing nests may get tangled in foundations therefore reducing abandoned gear in the OCS environment. The Endangered Nongame Species Program (ENSP) would like to see more data to support this assertion as there is not a valid benefit to birds without further data to indicate this is a regular occurrence. In reference to the Vattenfall 2023 study about bird movements within an offshore wind farm ENSP would be interested to see how nocturnal movements of birds through offshore wind farms could be studied once more wind farms are developed. In addition to the AMMM measures listed in table 3.5-3.6 ENSP would like BOEM to consider motion smear minimization using data from the 2020 study by Nygard - Efficacy of increased wind turbine visibility to reduce avian fatalities as well as the use of video cameras and radar to detect the rate of strikes avoidance behavior and possible attraction within the OSW farms (or best available technologies).	The beneficial effects of fishing nets/gear removal in the offshore environment (in this case with presence of WTGs) is cited in the PEIS (see Regular et al. 2013). While this study did not look at net/gear removal specific to WTG foundations, it did clearly demonstrate a beneficial effect from removal of nets and gear in the offshore environment. Assuming that WTG foundations would be a source of entanglement, it would be expected that birds in the offshore environment would experience some beneficial effect. BOEM would continue to use the most up-to-date and relevant literature on this potential impact as more offshore wind projects are evaluated on at the Atlantic OCS, including those in the NY Bight lease areas. Details on monitoring nocturnal movements of birds would be developed during the project-specific COP NEPA review, as appropriate. For example, if lessees were to implement RP BB-4, monitoring of nocturnal bird movements could be incorporated into the framework. BOEM previously looked into motion smear (for Ocean Wind 1 offshore New Jersey) and reviewed the commenter's cited study (BOEM notes that the study is actually May et al. 2020 and not Nygard, although Nygard is one of the authors). While BOEM acknowledges the May et al. (2020) study indicates a reduction in bird strikes with wind turbines with a black-painted blade, the results are preliminary, and eight turbines (half with black paint) is not a large sample size. In addition, relatively few bird carcasses were found both before and after painting the blades (a total of 42 dead birds at all eight turbines during the study period of 10 years). It is also not clear if the paint achieves the same results across different bird species, and its efficacy may be site specific. In addition, and more of a determining factor in the use of black paint on wind turbine blades in the United States, FAA's 2020 Obstruction Marking and Lighting Circular (70/7460-1M) includes a

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		section (Section 13) on wind turbine paint requirements (for aviation safety) that states the darkest acceptable paint color is light gray, with preference of pure white. Black paint on wind turbines is not allowed under the FAA circular. BOEM would continue to evaluate technologies to reduce collisions if post-construction monitoring indicates action should be taken.
BOEM-2024-0001-0448-0010	Office of Environmental Justice As outlined in Section 3.4.1 Air Quality the document states that most of the emissions would occur during construction. Due to multiple offshore wind projects occurring simultaneously throughout the east coast construction related emissions could cause adverse air quality impacts in the localized areas surrounding the ports and facilities. Many of the ports and supporting facilities associated with offshore wind development are in or adjacent to NJ overburdened communities such as the Paulsboro Marine Terminal the Repauno Port and Rail Terminal and the New Jersey Wind Port. There is no consideration in this section or section 3.6.4 about possible adverse air quality effects in hyperlocal areas during the construction period. OEJ recommends that hyperlocal air quality impacts be investigated. If adverse impacts are found to occur it is recommended to implement air monitoring programs during construction as a strategy to justify mitigation methods in Overburdened Communities (OBCs) from the impacts of increasing commercial vessel traffic air traffic truck and worker vehicle traffic onshore facility operations etc. The need for monitoring is further highlighted by the DPEIS acknowledgement that conditions will vary.	BOEM acknowledges that the PEIS does not include the specificity needed to make location specific determinations (see Section 3.6.4.2 on scope of the environmental justice analysis). The ports identified in the PEIS may support NY Bight offshore wind development but are representative ports, not necessarily planned. BOEM agrees that hyperlocal air quality impacts should be considered by the COP-level NEPA documents to ensure there are not disproportionately adverse impacts on communities with environmental justice concerns. Table G-2 of Appendix G, *Mitigation and Monitoring,* provides a summary of the RP measures that BOEM encourages lessees to analyze and consider implementing to avoid or reduce impacts on air quality. Thank you for your recommendation to implement air monitoring programs as a strategy to justify mitigation measures in overburdened communities.
BOEM-2024-0001-0448-0011	Transmission/NJ Prebuild Infrastructure The NJ Board of Public Utilities is pursuing an approach to coordinate the construction of offshore wind transmission cables by developing common infrastructure that will house these power cables in shared underground transmission corridors consisting of duct banks and cable vaults for four transmission lines called the Prebuild Infrastructure. NJDEP encourages BOEM to incorporate the review of the coordinated transmission solutions into the New York Bight Final PEIS to the extent practicable.	BOEM notes in Section 2.1.2.1.1 of the Final PEIS that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (New York City Public Policy Transmission Need [PPTN]) and nearshore (New Jersey Board of Public Utilities [NJBPU] Prebuild Infrastructure [PBI]) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey.

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		Appendix D, *Planned Activities Scenario*, has also been updated to describe the States of New Jersey and New York's public policies and offshore wind goals.

P.4.2.2 New Jersey Board of Public Utilities

Table P.4-8. Responses to Comments from the New Jersey Board of Public Utilities (BOEM-2024-0001-0437)

Comment No.	Comment	Response
BOEM-2024-0001-0437-0001	New Jersey is actively pursuing coordinated transmission solutions to efficiently integrate offshore wind power into the PJM system grid. Through the State Agreement Approach (SAA) NJBPU has awarded the Larrabee Tri-Collector Solution (LCS) to establish a new on-shore Point of Interconnection (POI). The LCS will be capable of incorporating at least 3742 MW of offshore wind capacity through up to four transmission lines. The Board is pursuing an approach to coordinate the construction of these lines by developing common infrastructure that will house these power cables in shared underground transmission corridors consisting of duct banks and cable vaults for four transmission lines. The Board is calling this common infrastructure the "Prebuild" or "PBI." Following discussions with stakeholders and technical experts Board Staff finds that employing the SAA in conjunction with this Prebuild work is necessary to maximize the benefits of SAA 1.0 and the LCS. The Board is currently in the process of soliciting PBI bids from transmission developers and will have further clarity on the precise cable routing of the PBI at the conclusion of the solicitation. This coordinated approach to transmission and associated common cable corridors will minimize environmental and community disturbances arising from on-shore transmission development. We encourage BOEM to incorporate the potential environmental benefits of these coordinated transmission solutions into the NY Bight PEIS.	BOEM notes in Section 2.1.2.1.1 of the Final PEIS that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (New York City PPTN) and nearshore (NJBPU PBI) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey.
BOEM-2024-0001-0437-0002	The NJBPU also suggests that BOEM considers adding an alternative course of action that incorporates exclusively the avoidance minimization mitigation and monitoring (AMMM) measures which	Refer to response to comment BOEM-2024-0001-0371-0004.

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	are already approved and demonstrated to be commercially viable into the PEIS. The existing options including no AMMMs or all AMMMs which encompass untested or uneconomic measures represent only the end member cases; the latter of which may be overly burdensome for developers. Introducing a middle-ground alternative that includes proven commercially viable AMMMs would better align with established regulatory processes.	

P.4.2.3 New York State Department of State/Department of Environmental Conservation

Table P.4-9. Responses to Comments from the New York State Department of State/Department of Environmental Conservation (BOEM-2024-0001-0317)

Comment No.	Comment	Response
BOEM-2024-0001-0317-0001	The Agencies recommend further consideration of the impacts to native hard-bottom habitat from the installation of cables and turbines. Impacts to native hard-bottom habitat are often permanent impacts negatively affecting species that utilize those areas. While scour protection may provide some mitigation for that loss it is not equal to the value of native hard bottom. Cable protection is not a suitable substitute for hard-bottom species to colonize. The impacts from hard bottom loss on a larger scale could be extremely detrimental to local marine species. [Footnote 10: Rochelle D. Seitz Hkan Wennhage Ulf Bergstrm Romuald N. Lipcius Tom Ysebaert Ecological value of coastal habitats for commercially and ecologically important species ICES Journal of Marine Science Volume 71 Issue 3 March/April 2014 Pages 648665 https://doi.org/10.1093/icesjms/fst152] The Agencies are not aware of studies concluding that introduced hard-bottom in the form of cable or scour protection will be able to replicate the biological value of native hard-bottom both in species recolonization and complexity. If there is not adequate detail on the presence of hard bottom habitat at this time then BOEM should undertake a detailed analysis of impacts to hard bottom habitats during the COP-specific review ensure avoidance is prioritized and evaluate the sufficiency of AMMM	As stated, during the project-specific COP-level NEPA analysis, the seafloor substrates will be described in more detail. While the scour protection may not be equal to the value of native hard-bottom habitat, the best available science indicates that species that require hard substrate for settlement are likely to settle on materials used for cable and scour protection. For example, in a newly published study on the settlement success of the European flat oyster, granite was the substrate with the highest settlement preference (ter Hofstede et al. 2024). Granite is often used in scour protection for offshore wind projects.

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	measures to offset these impacts (e.g. MUL-4 MUL-23 COMFIS-2 COMFIS-4).	
BOEM-2024-0001-0317-0002	Finfish Invertebrates and Essential Fish Habitat (Section 3.5.5): The EMF and cable heat analysis should primarily evaluate dipole bundled high voltage direct current (HVDC) export cables since these will be required for most export cables in the NY Bight due to the distance required to reach shore and state policy initiatives (e.g. mesh-ready). The cumulative impacts section should also acknowledge that interaction rates with finfish and benthic invertebrates increase as more cables with higher capacities are installed. In addition the Agencies continue to recommend a minimum target burial depth of 6 feet for all submarine cables where technically feasible. This burial depth is consistent with BOEM's Draft Fisheries Mitigation Guidance and typically provides sufficient protection to both the cable and maritime users in the area. This depth also reduces the risk of fishing gear interactions and mitigates the effects of EMF on sensitive species that inhabit and transit through a project area. The Agencies also recommend maintaining cables in a bundled state or if unbundling is necessary to bury in a single trench to further reduce EMF and habitat impacts. In addition the New York District U.S. Army Corps of Engineers (USACE) also has a guidance value of a minimum of 7 feet burial depth. [Footnote 9: USACE NY District Nationwide Permit 57 - Electric Utility Line and Telecommunications Activities Permit-specific Regional Conditions b(2)(iv) states "[i]n areas outside of Federal project channels fleeting or anchorage areas the top of the utility line shall be located a minimum of 7 feet below the existing bottom in sediment and 2 feet below the existing bottom in compacted rock."] All certificated NYS offshore wind projects have been required to meet a target burial depth of 6 feet in NYS waters as part of the project-specific NYS Public Service Law Article VII Certification Conditions. Reducing habitat impacts is expected to indirectly benefit ocean users like commercial fishermen by minimizing habitat changes and the risk of interactions with fishing gear.	Text regarding EMF and heat has been added to Section 3.5.5 of the Final PEIS regarding cable heat from HVDC cables. Section 2.1.2 provides the RPDE, which states that 3–19.6 feet (0.9–6 meters) is the anticipated potential range of burial depth; 6 feet (1.8 meters) is the typical target burial depth. Depths may vary based on site-specific factors (e.g., soil type, cable/pipeline crossings, crossing of navigation channels or other federal civil work projects, other federal or state requirements). Cable installation will comply with all permit and certification requirements.
BOEM-2024-0001-0317-0003	Marine Mammals (Section 3.5.6): The Agencies recommend considering and expanding the discussion of noise effects on marine	National Research Council 1994 and 2000 were reviewed and added as references in Section 3.5.6.1.3.

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	mammals. Case studies regarding the impact of low frequency sound on cetaceans and the hearing sensitivity of baleen whales have been in existence for many years. Below are example citations that could be referenced: - National Research Council. 1994. Low-Frequency Sound and Marine Mammals: Current Knowledge and Research Needs. Washington DC: The National Academies Press. https://doi.org/10.17226/4557.- National Research Council. 2000. Marine Mammals and Low-Frequency Sound: Progress Since 1994. Washington DC: The National Academies Press. https://doi.org/10.17226/9756.- Jebelli A. Yagoub MCE Dhillon BS and Lotfi N. 2018. Effect of Low-Frequency Noise on Humpback Whale Behaviors. Journal of Oceanography and Marine Research 6: 186.- Croll D. Clark C. Calambokidis J. Ellison W. and Tershy B. February 2001. Effect of anthropogenic low-frequency noise on the foraging ecology of Balaenoptera whales Animal Conservation Volume 4 Issue 1 pp. 13-27. https://doi.org/10.1017/S1367943001001020.- National Research Council. 2003. Ocean Noise and Marine Mammals. Washington DC: The National Academies Press. https://doi.org/10.17226/10564. Underwater noise from impact and vibratory pile driving drilling and increased vessel noise related to offshore wind development would fall into the low-frequency category. Noise from unexploded ordnances (UXO) detonations would also be audible to low-frequency cetaceans. Baleen hearing range as currently understood has minimal overlap with the noise generated by seafloor mapping surveys. Low-frequency cetaceans may be at risk of masking by lower frequency construction-related vessel traffic but vessel traffic is generally not uncommon in the PEIS study area. With respect to pile driving most energy in pile-driving noise is at low frequencies.	National Research Council 2003 is already referenced in Section 3.5.6.1.3 of the PEIS when discussing potential impacts of noise on marine mammals, and was not carried forward into Section 3.5.6.3.3 because the discussion of vessel noise, vibratory piling, and drilling focused on more recent papers for conciseness in the main body of the PEIS. Jebelli et al. (2018) has not been included in the discussion of geophysical equipment noise effects or any other noise effects section because it lacks applicability to the noise sources in question and relies on highly theoretical assumptions for programmed Autonomous Underwater Vehicle "behavior," not animal behavior, that are not relevant to NY Bight or associated impact assessments. Croll et al. (2001), though focused on low-frequency Navy sonar noise, was added to the discussion of vessel noise in Section 3.5.6.3.3 to illustrate how other factors may drive behavioral changes that are unrelated to low-frequency noise exposure. In response to the latter part of the comment, BOEM agrees all these sources contain sound energy in lower frequencies below 1,000 hertz and would therefore fall more within the low-frequency cetacean hearing range, and this was considered in the assessment of effects in this PEIS. However, another important consideration, which is illustrated by the recommended references provided, is the characteristics of the sound source type and available data show that marine mammal responses differ for impulsive vs. non-impulsive noise; intermittent/pulsed vs. continuous noise; and underwater explosions vs. non-explosive sound sources. Therefore, information provided in Sections 3.5.6.3 and 3.5.6.4 discusses research analyzing low-frequency noise sources from sources with similar characteristics to the source being discussed to comprehensively assess the risk of effects on marine mammals in the PEIS.
BOEM-2024-0001-0317-0004	Commercial Fishing (Section 3.6.1): For clarity the impacts to commercial and for-hire recreational fisheries should be stated separately. That is the FEIS should state specifically what the impacts to commercial fisheries would be and what the impacts to	For this programmatic analysis, the impacts range from negligible to major because project-specific details are not yet known and the analysis considers the impact range across all IPFs.

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	recreational for-hire fisheries would be for each of the alternatives. For example the Draft PEIS currently states that "impacts on commercial fisheries and for-hire recreational fishing are expected to range from negligible to major." [Footnote 11: See PEIS pg. 3.6.1-52] As is it is not clear whether the impacts to each of the commercial and for-hire recreational fisheries are expected to be "major" or whether this is an aggregate or overall level of impact. For comparison BOEM has analyzed the potential impacts to these fishing industries separately in project-specific EISs like the Empire Wind EIS. [Footnote 12: See Empire Wind FEIS pg. 3.9-65: "Therefore BOEM expects that the impacts resulting from the Proposed Action would be moderate to major for commercial fisheries and minor to moderate for for-hire recreational fishing depending on the fishery and fishing vessel."]	
BOEM-2024-0001-0317-0005	6. Mitigation and Monitoring (Appendix G): a. Mariner Communication Plan: As recommended in the State's PEIS scoping comments the Agencies continue to recommend developing a Mariner Communication Plan that addresses all phases of development (Surveys Construction Operations Decommissioning). Robust and targeted outreach continues to be needed across the diverse users in the assessment area including commercial vessel operators commercial fishermen for-hire/charter fishermen recreational fishermen recreational boaters divers etc. Wind development occurring outside of the East Coast's busiest port and shipping lanes necessitates careful coordination to protect the safety of all mariners. This plan would supplement the NY Bight lease stipulation to implement Fisheries Communication Plans. b. Fisheries Mitigation (COMFIS-4): The Agencies continue to recommend a minimum target cable burial depth of 6 feet in state and federal waters for all projects where technically feasible as noted in Item 4 (above). c. Commercial Fisheries Mitigation (COMFIS-6): The Agencies recommend that lessees utilize and contribute to the Regional Compensation Fund once it is established through the 11-State effort. The States are working together to advance a shared vision of a consistent regional approach for the Atlantic Coast's commercial and	Thank you for your comment. Existing notice to mariners covers all phases of development. Burial depth for each project will be specifically determined at the project-specific phase. COMFIS-7 (fisheries compensation fund) has been added to encourage lessees to consider contracting with a neutral third party to process claims, manage and disburse funds, and handle appeals.

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	for-hire recreational fishing industries and supporting infrastructure through the conceptual development of a regional compensation fund to be managed by an independent Regional Fund Administrator. The States have reached consensus on the need for an expert independent party to lead the design and development of an effective claims process and governance structure for the Fund that reflects input from all affected sectors especially those most directly affected fishing enterprises and infrastructure support. With start-up funds secured a request for proposals is expected to be released by NYSERDA in early 2024.	
BOEM-2024-0001-0317-0006	On-going Coordination: The Agencies note that notwithstanding BOEM's obligation to analyze environmental impacts for proposed and future projects within the NY Bight including State waters and relevant upland transmission components the State has a parallel process pursuant to Article VII of New York State Public Service Law 120 et. seq. that analyzes the need for and environmental impacts of transmission components within the State's jurisdictional boundary. By participating in BOEM's NEPA review and as parties to relevant Article VII proceedings NYSDOS NYSDEC and NYSDPS are committed to facilitating continued coordination between the State and federal review processes. The Agencies appreciate the opportunity to provide this input and look forward to continued collaboration as BOEM undertakes an important next step in concluding this federal environmental review.	Thank you. Comment noted.
BOEM-2024-0001-0317-0007	b. The Agencies recommend careful review of the impact levels estimated under Alternatives B and C. The Agencies note that between the stated impacts summary (pp. 2-23 to 2-38) and the text there are no differences in stated impacts for many resource areas even though several AMMM measures are identified that could reduce impacts to those resources if adopted now. The Agencies support establishing AMMMs in the PEIS to address anticipated impacts and are available to assist BOEM in clarifying impact levels between alternatives.	BOEM has clarified that Alternative B serves to compare how impacts would change with the AMMM measures identified in Alternative C. Alternative C now distinguishes between AMMM measures that have been previously applied and those that have not been previously applied. RPs are not analyzed within the alternatives analysis. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information The edits to Alternative C were made to help better distinguish the potential benefits of previously applied and not previously applied AMMM measures.

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BOEM-2024-0001-0317-0008	BOEM "anticipates that the cumulative impacts on benthic resources in the geographic analysis area would likely be negligible to major with moderate beneficial impacts. The incremental impacts for six NY Bight projects with AMMM measures incorporated would be reduced at a functional level although impact determinations would not change. In the context of other reasonably foreseeable environmental trends (Appendix D) the incremental impacts contributed by Alternative C to the cumulative impacts on benthic resources would be noticeable." [Footnote 8: See Draft PEIS pg. 3.5.2-38] This does not identify or illustrate these trends nor relay any direct correlation to offshore wind environmental impacts.	Thank you for your comment. For details regarding impacts on benthic resources from offshore wind projects, see PEIS Section 3.5.2.5 to see how the proposed mitigation measures (AMMM measures) would alter the impacts, if implemented.
BOEM-2024-0001-0317-0009	Level of Impacts: a. The Agencies urge BOEM to refine its impact level definitions to more accurately evaluate the Proposed Action and Alternatives. The cumulative impacts are often too broadly identified to provide a clear picture of how a full build-out would affect the resource area. For example: - BOEM anticipates that "the cumulative impacts on coastal habitat and fauna in the geographic analysis area even with application of AMMM measures under Alternative C would likely be negligible to moderate under six NY Bight projects. In context of reasonably foreseeable environmental trends the incremental impacts contributed by six NY Bight projects to the cumulative impacts on coastal habitat and fauna are unlikely to be detectable." [Footnote 5: See Draft PEIS pg. 3.5.4-20] This presents a wide discrepancy in impact declaration and characterization and does not focus enough on the expected impacts of the Alternatives.	The PEIS uses a four-level classification scheme to characterize the potential beneficial and adverse impacts of the Proposed Action and alternatives. Impact levels described in BOEM's *Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf* (MMS 2007) were used as the initial basis for establishing adverse impacts specific to each resource. These resource-specific adverse impact level definitions were then further refined based on prior NEPA analyses, scientific literature, and best professional judgment. Impact level ranges are broad due to the large RPDE analyzed. During the project-specific, COP-level NEPA analyses, impact level definitions can be refined to address project-specific impacts.
BOEM-2024-0001-0317-0010	The Agencies recommend that BOEM reconsider the impact level determined for Electric and Magnetic Field (EMF) impacts on benthic resources. As recognized in the Draft PEIS there are significant knowledge gaps regarding this topic and the effects of EMF on most invertebrates are understudied. Of the species-specific in- situ studies conducted to date there is evidence that anthropogenic EMFs can result in an "ecologically significant behavioral response" in little skate and American lobster (Hutchinson et al. 2020) [Footnote 6: Hutchison Z.L. Gill A.B. Sigray P. et al. Anthropogenic electromagnetic	The impact determination is consistent with other EISs. More details and analyses will be included in the project-specific COP NEPA documents.

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	fields (EMF) influence the behavior of bottom-dwelling marine species. Sci Rep 10 4219 (2020). https://doi.org/10.1038/s41598-020-60793-x]. Furthermore, the Draft PEIS references Gill and Desender (2020) [Footnote 7: Gill Andrew B. & Desender Marieke. 2020 State of the Science Report Chapter 5: Risk to Animals from Electromagnetic Fields Emitted by Electric Cables and Marine Renewable Energy Devices. United States. https://doi.org/10.2172/1633088] to support the statement that "no differences have been observed between benthic communities in energized cables compared to controls." However, in this same paper Gill and Desender (2020) conclude that "the lack of specific information has led to the general conclusion that EMFs associated with subsea cables are not harmful and do not pose a risk to biota... However, the lack of evidence does not necessarily equate to a lack of impact." Lack of knowledge about EMF impacts does not mean there will be negligible impacts. Therefore, the Agencies recommend a more conservative impact level determination of "minor" at this time for EMF impacts on benthic resources and more in-situ study on this topic to improve clarity.	
BOEM-2024-0001-0317-0011	Transmission review efficiencies: The Agencies encourage BOEM to identify review efficiencies between the NY Bight PEIS and NYC PPTN project and where possible without delaying either take steps necessary to begin analyzing the environmental effects of the NYC PPTN in the PEIS. The PEIS already analyzes prospective transmission infrastructure associated with projects in the NY Bight leases and could also include regional transmission solutions contemplated by neighboring states. Because portions of the NYC PPTN project may occupy federal waters it is expected to have similar effects and a study area that overlaps with that of the PEIS. This could allow early analysis of environmental effects many of which are already described in the PEIS study area off of New York and in NYC waters as well as potential tiering for a future COP or General Activities Plan associated with the NYC PPTN.	BOEM notes in Section 2.1.2.1.1 of the Final PEIS that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (New York City PPTN) and nearshore (NJBPU PBI) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey.
BOEM-2024-0001-0317-0012	The Agencies offer the following detailed comments on the Draft PEIS and request that BOEM evaluate and address the following: 1. Preferred Alternative: The Agencies generally support adopting	BOEM acknowledges New York State Agencies’ support of Alternative C.

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	AMMM measures (Alternative C) as a preferred alternative in the PEIS vs. deferring their adoption to the project-specific review (Alternative B).	
BOEM-2024-0001-0317-0013	BOEM's No Action (Alternative A) is not an acceptable path forward based on the analysis of impacts in the Draft PEIS.	BOEM acknowledges New York State Agencies' lack of support of Alternative A.
BOEM-2024-0001-0317-0014	Through Alternative C BOEM has crafted a discrete list of technically feasible AMMM measures tailored to the NY Bight region that provide clear expectations for forthcoming project designs. Clearly prioritizing the PEIS AMMM measures through immediate adoption provides predictability helps address disproportionate effects to frontline communities and buttresses Federal and State investments in climate adaptation and coastal resilience strategies. However the Agencies caution that the effectiveness of the measures finally adopted should be well-supported and maximize federal funding opportunities in part because the costs of offshore wind development are largely borne by the State's ratepayers.	BOEM acknowledges New York State Agencies' support of Alternative C. BOEM has considered all comments received on AMMM measures and made adjustments to the AMMM measures based on comments as presented in Final PEIS Appendix G. Refer to response to comment BOEM-2024-0001-0371-0004 for updates to alternatives in the Final PEIS. The Proposed Action for the Final PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. No measures will be implemented immediately. These measures may be required as conditions of approval for activities proposed by lessees in COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.
BOEM-2024-0001-0317-0015	For example the Agencies believe that incorporating the use of shared transmission corridors in the NY Bight whenever such infrastructure is reasonably available to the proposed offshore platform (MUL-18) is justifiable as a cost-effective and protective approach to development. Shared corridors offer benefits in terms of both cost and reduced impacts to coastal resources ocean users harbor operations and host communities. New York has moved forward to develop offshore transmission infrastructure capable of collecting energy generated at multiple offshore platforms and delivering it to onshore interconnection points. The New York State Public Service Commission (the Commission) by Order issued June 22 2023 initiated	BOEM notes in Section 2.1.2.1.1 of the Final PEIS that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (New York City PPTN) and nearshore (NJBPU PBI) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey.

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	a competitive process for the submission of proposals to build at least 4700 MW and up to 8000 MW of transmission capacity to serve the State's 9000 MW target (New York City Public Policy Transmission Need; PPTN). [Footnote 3: Case 20-E-0197] This action effectively ensures coordinated transmission and generation project development within a single development envelope. The solicitation will result in selection of the most efficient proposal in late 2025. In support of the New York City PPTN NYSERDA included contract terms in the 2022 offshore wind solicitation (ORECRFP22-1) requiring awardees to make commercially reasonable decisions to change their point of interconnection to those developed through the New York City PPTN upon NYSERDA's request. Subsequently NYSERDA built on this requirement in the 2023 solicitation by capping offshore wind solicitation awards to no more than 1400 MW into New York Independent System Operator's Zone J. Further adjustments in the planned 2025 OREC solicitation will require awardees to connect to the coordinated infrastructure developed pursuant to the New York City PPTN process. Thus the State will effectively mandate compliance with the mitigation measure identified in the Draft PEIS as MUL-18. Should New York expand its target for offshore wind beyond 9000 MW the Agencies expect the Commission and NYSERDA to take a similar approach because of its cost efficiencies and lower overall environmental and community impacts. BOEM's recognition in the PEIS of the value of using shared infrastructure in the NY Bight will align State and federal policy into the future. [Footnote 4: The Agencies further suggest that other Northeast States may make similar policy decisions given the advantages of coordinated transmission planning.]	
BOEM-2024-0001-0317-0016	When considering which AMMM measures to adopt as part of the Final PEIS the Agencies urge BOEM to carefully evaluate each measure's feasibility and proven effectiveness. Where AMMM measures do not meet this benchmark BOEM should consider removing them from the Final PEIS and as appropriate revisit them in the project-specific COP review. The AMMM measures should address the range of anticipated environmental impacts and be written in a manner to allow for flexibility over time in consideration	Thank you for your comment. BOEM has updated the alternatives analysis and reviewed all AMMM measures. Not all AMMM measures are being recommended as COP approval T&Cs in the Final PEIS; many are now identified as RPs. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information.

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	of project feasibility (including economic feasibility) and inclusive of a range of approaches based on feasibility and best available science. Offshore wind energy development is a substantial opportunity to reduce greenhouse gas emissions stemming from the combustion of fossil fuels and the environmental degradation caused by climate change.	
BOEM-2024-0001-0317-0017	Finally the Agencies commend BOEM for providing meaningful community engagement and articulating targeted mitigation measures that address impacts to historically marginalized and disadvantaged communities. By establishing the NY/NJ Environmental Justice Forum at the start of the PEIS BOEM has provided nearly two years of shared learning opportunities across governments tribal nations and diverse community-based organizations in the region. This forum is a means to establish ongoing and long-term engagement with Environmental Justice communities and it provides community representatives with an avenue to offer feedback to BOEM as appropriate. These types of collaborations accelerate the Biden administration's Justice40 initiative and compliment State-led efforts like the NYS Climate Act investments in NYS Disadvantaged Communities and the Offshore Wind Environmental Justice Technical Working Group. Additionally the Draft PEIS includes AMMM measures targeting community engagement as well as an Environmental Justice Compensatory Mitigation Fund through which lessees would make financial contributions to offset disproportionate and adverse impacts to environmental justice communities directly tied to offshore wind activities. BOEM's commitment to supplementing its standard outreach to integrate co-design concepts and seeking regional solutions to adverse cumulative impacts in these ways provides a useful template for future offshore wind environmental reviews across the nation.	Thank you for your comment.
BOEM-2024-0001-0317-0018	We commend BOEM's inclusion of a Representative Project Design Envelope that reflects refinements from recent projects (e.g. uniform turbine layout high- voltage direct current transmission typical six-foot cable burial depth). The Draft PEIS also includes forward-looking AMMM measures such as utilizing a shared transmission corridor	Thank you for your comment.

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	among others. [Footnote 2: The multi-resource Shared Transmission Corridor AMMM or "MUL-18" states: "Lessees should coordinate transmission infrastructure among projects. Where practicable transmission infrastructure should use shared intra- and interregional connections have requirements for meshed infrastructure apply parallel routing with existing and proposed linear infrastructure (including export cables and other existing infrastructure such as power and telecommunication cables pipelines) and limit the combined footprint to minimize impacts and maximize potential capacity. Where possible incorporate cable siting principles and routing measures for export cables and associated substations developed from the Atlantic Offshore Wind Transmission Study and the BOEM/DOE transmission planning effort the NYSERDA's Offshore Wind Cable Corridor Constraints Assessment associated NYS Public Service Commission orders and the results of other state and ISO/RTO transmission planning processes to maximize the utility of Points of Interconnection (POIs). Lessees considering landfall in New Jersey should also comply with the results of the state agreement approach (SAA) and any other future procurements resulting from similar initiatives.]	
BOEM-2024-0001-0317-0019	The Agencies generally concur in the appropriateness of the proposed AMMM measures and encourage BOEM to adopt them subject to the considerations discussed below as baseline requirements for offshore wind development in the NY Bight. Taking this step to adopt well-supported AMMM measures will help achieve efficiencies lower costs and streamline aspects of project permitting and the related environmental reviews while protecting sensitive resources and ocean uses vitally important to the Blue Economy.	Thank you for your comment.

P.4.2.4 Massachusetts Office of Coastal Zone Management

Table P.4-10. Responses to Comments from the Massachusetts Office of Coastal Zone Management (BOEM-2024-0001-0319)

Comment No.	Comment	Response
BOEM-2024-0001-0319-0001	Implementation of this PEIS There is increasing recognition that the scale of offshore wind development on the U.S. East Coast necessitates a regional look at cumulative impacts. In light of this we appreciate that BOEM is employing an analysis in this PEIS that facilitates comparison between one and many (6) projects. We encourage BOEM to continue to consider regional and cumulative impacts during subsequent offshore wind development including in the Gulf of Maine. We also encourage BOEM to employ this regional and cumulative view of impacts as early in the siting and leasing process as possible.	The cumulative impact analysis in the PEIS considers reasonably foreseeable planned activities including federal and non-federal activities not yet undertaken, but sufficiently likely to occur, that a responsible official of ordinary prudence would take such activities into account in reaching a decision (43 CFR 46.30). The federal and non-federal activities, including offshore wind activities, that BOEM must take into account in the analysis of cumulative impacts include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by BOEM. Reasonably foreseeable planned actions do not include those actions that are highly speculative or indefinite. Cumulative impacts in the Gulf of Maine are analyzed for those resources that have geographic analysis areas that include the Gulf of Maine (e.g., birds, finfish, marine mammals, commercial fisheries).
BOEM-2024-0001-0319-0002	The "tiered" use of this PEIS described in the document will hopefully streamline the project-specific environmental reviews that follow this analysis. The overview of the affected environment and resources in the geographical analysis area the qualitative discussion of impact producing factors (IPF)s and the baseline avoidance minimization mitigation and monitoring (AMMM) measures in the PEIS will allow project specific NEPA reviews to focus on IPFs quantitatively and to address any concerns particular to one project. We expect project specific NEPA analyses will present data and include results of sampling and surveys in lease areas for most resources offshore.	BOEM agrees with the comment.
BOEM-2024-0001-0319-0003	The subsequent project specific NEPA reviews for the six New York Bight leases are expected to incorporate the AMMM measures in this PEIS by reference. The draft PEIS states that under certain circumstances BOEM may exclude some of these measures or add ones not mentioned here. For this PEIS to expedite the NEPA process for any individual project steps should be taken in those subsequent NEPA reviews to make clear to reviewing agencies and the public	For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that will be included in the COP-specific NEPA analysis for each lease area. Each COP NEPA analysis will consider the best available data and information that reflect the state of the science at the time of publication. Project-specific agency consultation will be conducted

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	which measures are excluded from and which are additional to the baseline set by this PEIS. If it is clear to agencies what the baseline is and what is different from the baseline reviews can be as efficient focused and helpful for BOEM and project proponents as possible.	for each EIS to inform the development of applicable AMMM measures for each lease area. The COP-specific NEPA ROD for each lease area will describe the specific terms and conditions for which compliance is required (40 CFR 1505.3), including any applicable AMMM measures analyzed in the PEIS.
BOEM-2024-0001-0319-0004	Compensatory Mitigation In this PEIS compensatory mitigation plans are described for birds fisheries and Environmental Justice communities. Hopefully these measures can be implemented effectively and their use can be expanded to other marine and coastal resources and uses. Specifically regarding compensatory mitigation for Environmental Justice communities CZM encourages BOEM to consult Massachusetts' Environmental Justice Strategy [Embedded Hyperlink: https://www.mass.gov/doc/february-2024-environmental-justice-strategy-english/download] for additional guidance and resources. We also look forward to seeing the forthcoming guidance from BOEM on compensatory mitigation approaches including third-party managed regional funds. Compensatory mitigation for wildlife and habitat including protected species commercial fisheries and other resources and uses will benefit from a coordinated regional approach.	BOEM appreciates the feedback on the potential compensatory mitigation measure for environmental justice. BOEM has determined that EJ-4 would be infeasible to implement and enforce within the agency's statutory authority as a condition of approval. Therefore, EJ-4 is no longer an AMMM measure being considered in the PEIS.
BOEM-2024-0001-0319-0005	The relocation of boulders on the seafloor and the installation of scour protection cable armoring and other structures on the seafloor can pose hazards for mobile gear fishermen interfere with other marine uses and may alter seafloor habitat. BOEM should establish clear and consistent guidelines for boulder relocation and bottom disturbance best practices based on advice from relevant federal and state agencies. BOEM should also establish protocols and/or guidance for reporting any relocated boulders and disturbed seabed features to marine users including fishermen research entities and others. While some boulder considerations such as appropriate destination locations may be best handled on a project-by-project basis a regional and comprehensive approach that simplifies and standardizes the reporting of moved boulders and other seafloor hazards across projects and developers is needed. BOEM should specify in this PEIS a	Appendix G includes AMMM measures for boulder identification relocation. The data in Tables 3.6.1-2 and 3.6.1-3 have been updated for New Hampshire and Connecticut. Unfortunately, the values from previous years do change over time, so the date of these newly provided values is provided as a footnote to the table.

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	baseline expectation for reporting boulder relocations to mariners for boulders greater than 0.5 m. As noted above CZM has participated as a cooperating agency in the review of a preliminary version of this draft PEIS. We appreciate the correction of the data transposition and citation errors in Tables 2 and 3 of section 3.6.1.1.2 that were identified during that review. However in the revised table Connecticut is reported to have "1569" in revenue in 2021 (presumably a typo) and New Hampshire's 2021 revenue of 486990 (in $1000s) seems unlikely given that years 2012-2022 were less than a tenth of this amount and there was no commensurate jump in landings for that year. We reiterate our concern that these data should be checked carefully given their importance to estimating the impact of wind development and identifying sufficient mitigation measures to the fishing industry. Although citations have been corrected per our prior comment the URLs currently result in a 404 error which makes checking the data entries more difficult.	

P.4.3 Cooperating Local Agencies

P.4.3.1 New Bedford Port Authority

Table P.4-11. Responses to Comments from the New Bedford Port Authority (BOEM-2024-0001-0444)

Comment No.	Comment	Response
BOEM-2024-0001-0444-0001	As a cooperating agency that participated in the review of the New York Bight Preliminary Draft Programmatic Environmental Impact Statement (PEIS) we appreciate the opportunity BOEM afforded us to comment on the preliminary document. We understand that BOEM attempted to address some of our comments in the final draft document but we are concerned that the document remains problematic by not sufficiently addressing the impact of these areas on commercial fishing. Any EIS document must have at its core an understanding that offshore wind development not only negatively affects the scallop resource it also affects the scallop fishing industry activities. As a mobile gear fishery scallop vessels are among the	The impact on the scallop fishery is addressed in the document. Section 3.6.1.3.2 acknowledges that mobile fishing gear could be limited temporarily or permanently within certain locations within the lease area, which could lead to losses in revenue for the scallop industry. COMFIS-3 attempts to mitigate the impacts by increasing data and knowledge about the scallop fishery, which may result in the future development of other mitigation measures that could benefit the scallop fishery or other commercial or for-hire recreational fisheries.

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	largest vessels in the east coast fishing fleet. Individually they have the least opportunity to be able to maneuver and fish within a wind farm. It is concerning that the items in the PEIS regarding fisheries mitigation take a "one size fits all" approach with ingrained assumptions regarding the ability of commercial fishermen to "adapt" and fish within the WEA.	
BOEM-2024-0001-0444-0002	Although we have never advocated for the "No Action" alternative we are troubled that the draft PEIS does not consider a wider range of alternatives to help avoid minimize and mitigate the effects of OSW on our fishing industry and habitat especially relative to the scallop industry.	The purpose of the PEIS is to identify AMMM measures that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. At this programmatic stage, BOEM is not considering individual alternatives or AMMM measures that are project specific. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP-specific NEPA stage.
BOEM-2024-0001-0444-0003	Although many commercial fishermen and fisheries will be affected the scallop industry will be the fishery most adversely affected by wind development in the New York Bight. While we certainly support items in the PEIS such as the development of a scallop monitoring plan [bold and italicized: (COMFIS-3 Scallop Monitoring Plan)] detailed fisheries mitigation [bold and italicized: (COMFIS-4)] and fisheries compensatory mitigation [bold and italicized: (COMFIS-6)] these items together while important maybe too little or too late to protect the industry after the fact. Monitoring may lead to compensation to the scallop fishermen individually but financial compensation is supposed to take place as the last mitigation phase not as a substitute to other mitigation measures. First and foremost fishermen want to continue to be able to fish safely and productively in the New York Bight where the scallop resources are centered. We remain concerned that financial compensation is seen by BOEM as a substitute or reasonable alternative to other mitigation such as avoidance and minimization.	Thank you for your comment. The NY Bight lease areas were designed to avoid certain commercial fishing activities based on stakeholder input and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid the mid-shelf scarp (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/ATLW-8-NY-Bight-Final-Lease-Sale-Decision-Memorandum.pdf). Per the memo, "Specifically, in response to the commercial fishing industry BOEM excluded area adjacent to the scallop access area, included a buffer between select leases and removed areas of high value and benthic diversity." Additional information is found in Section 5.1.4.1 of the memo. BOEM agrees that compensatory mitigation is the last step in the mitigation hierarchy. A tenet of EFH is avoidance first. BOEM will evaluate project-specific impacts based on the project-specific COP before issuing a ROD. BOEM provides this guidance to first look at avoidance and minimization. Guidance on the financial compensation can be found here: https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf.

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		Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan, which includes scallops. Project-specific details will be addressed during the COP-level NEPA analysis and NMFS consultation for each project.
BOEM-2024-0001-0444-0004	There remains time to reassess the wind energy development in the Bight. BOEM can still shift offshore wind development away from Mid-Atlantic scallop beds in the Bight and develop reasonable alternatives regarding siting turbine layouts cable burial depths and effects on the scallop species in general.	The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project based on the project design for turbine layout and cable routes proposed by the developer. Refer to Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, for discussion and analysis of potential impacts on commercial fishing, including scallop beds. Project-specific NEPA analysis of effects on commercial fishing within a specific lease area will be conducted once a COP is submitted for BOEM review.
BOEM-2024-0001-0444-0005	3.6.3-1 Demographics Employment and Economics The geographic analysis area is flawed in that it fails to account for the economic impact of the project on areas where the primary commercial impact of the NY Bight will be felt. Namely the commercial fishing port(s) where the fish caught in the NY Bight are landed. Over 60% of the economic impact felt by fisheries affected by the NY Bight will be felt in ports and communities in Massachusetts particularly the Port of New Bedford.	Thank you for the comment. Commercial fisheries and for-hire fishing industries are evaluated in Section 3.6.1. The impact assessments include fisheries and ports as far north as Maine. COP-specific NEPA analyses will include all affected communities in assessments when project-specific information is available.
BOEM-2024-0001-0444-0006	3.6.7-21 Scientific Research and Surveys Despite this language "Overall ongoing and reasonably foreseeable planned offshore wind energy projects in the geographic analysis area would likely have major effects on NOAA's scientific research and protected species surveys potentially leading to impacts on fishery participants and communities; as well as potential major impacts on monitoring and assessment activities associated with recovery and conservation programs for protected species" there are no AMMM measures that would specifically address the impact to NOAA stock surveys. In fact all that is provided is that "BOEM is committed to working with NOAA	BOEM has committed to working with NOAA to implement the Federal Survey Mitigation Strategy program. The PEIS addresses the adverse impacts of WTG structures on surveys in Section 3.6.7.4.1, *Scientific Research and Surveys*. Please refer to OU-7 in Table 3.6.7-6 for survey mitigation measures.

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	toward a long-term regional solution to account for changes in survey methodologies as a result of offshore wind farms." This begs the question of how a project can be approved when an issue that impacts two major areas of the NEPA review remains in the "looking for a solution" area of mitigation. While it is good that there is an effort to develop new mitigation measures over the life of the project and an effort to assess cumulative impact there are over 30 leases signed and multiple projects underway with an approved EIS and COP. When it comes to the impacts on the ecosystem and commercial fishing absent a cumulative impact assessment very soon any damage done may be irreversible.	
BOEM-2024-0001-0444-0007	Appendix E: Analysis of Incomplete and Unavailable Information Other sections of the document including [bold and italicized: (E.1.7 Essential Fish Habitat)] and [bold and italicized: (E.1.11 Commercial Fisheries and For-Hire Recreational Fishing)] note the uncertain incomplete or unavailable information related to this wind energy area. BOEM NOAA and other federal agencies must take the opportunity now to fully study monitor and analyze current projects that are already erected and delivering power to the grid most notably (Vineyard Wind I and South Fork Wind) in the Massachusetts and Rhode Island WEA to guide the process of the New York Bight moving forward. Furthermore guidance should be consistent across projects all along the East Coast in terms of grid layout mitigation and data collection. In doing so BOEM in conjunction with their federal partners should have a central database and depository for data collection studies and monitoring activities that are planned ongoing or already have been completed.	Thank you for your comment. The creation of a database is not within the scope of this PEIS. However, the Environmental Studies Program Information System Quarterly Reports include summaries of the BOEM environmental studies that are completed each quarter. They can be found here: https://www.boem.gov/environment/environmental-studies/environmental-studies-information. These studies inform BOEM's policy decisions on the development of energy and mineral resources on the OCS. One such study measured EMFs from alternating and direct currents from a subsea cable in Long Island Sound on American eel movements and migrations (Hutchison et al. 2021).
BOEM-2024-0001-0444-0008	Appendix G: Mitigation and Monitoring As the most profitable fishing port in the nation and the hub for countless onshore businesses and families who rely on the industry we believe that it is vital that the actual impact of the development of offshore wind on the economy and people of Massachusetts be established using the best available data methods and information to truly measure the impact of this project on our fishing industry and those that support it. With that said we commend BOEM for laying out broad mitigation monitoring	Thank you for your comment.

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	and compensatory plans for the expected wind energy development in the New York Bight. These plans are more thorough and specific than past Draft Environmental Impact Statements and are a step in the right direction in fully addressing the potential effects on our commercial fishing industry. Yet steps can be taken (see below) to address the concerns we have relative to the scallop fishery and the economic benefits this fishery has on the Port of New Bedford and the region as a whole.	
BOEM-2024-0001-0444-0009	While we realize that specific locations of potential projects are not known currently we support what is laid out in [bold and italicized: MUL-25] Consistent Turbine Layout Markings and Lighting. [Bold and italicized: MUL-25] Consistent Turbine Layout Markings and Lighting "Lessees should employ consistent turbine grid layouts spacing markings and lighting among lease areas to minimize navigational hazards and facilitate other ocean uses such as fishing and recreational activities. Turbines should have one of the two lines of orientation per lease stipulation spaced at least 1 nautical mile (1.9 kilometers) apart to support navigation safety and Search and Rescue (SAR). This recommended spacing is based on the USCG's 2020 Massachusetts and Rhode Island Port Access Route Study). The spacing would also preserve structure-free areas to facilitate seabird passage and fishing operations. Also per lease stipulations adjacent lease areas that do not adopt the same layout must have an additional setback from shared borders. "We continue to stress that all projects must be consistent in as many areas as possible including the important issue of proper spacing.	Please refer to response to comment BOEM-2024-0001-0370-0001. Project-specific layouts will be analyzed during subsequent NEPA analysis based on information provided in the COP.
BOEM-2024-0001-0444-0010	G-37 It is not clear if BOEM is proposing one fund for the NY Bight or multiple funds. We recommend one fund as it makes it simpler and more straightforward for claimants and makes sure that all claims are handled in the same way. Fisheries mitigation funds that were previously set up contain a one-time payment limitation and no payments should a permit transfer. Such limitations ignore the impact on commercial fishing as a whole and limit mitigation to an individual fisherman. As the life of these projects is 25-30 years the need for mitigation clearly extends past the one-time payment. Any financial	While a payment may be a one-time event or multiple payments over a series of years, the BOEM-recommended duration of mitigation includes the construction period, a cascading percentage of revenue exposure funding for the first 5 years in the operational period, and the decommissioning period. Current drafts of T&Cs state that BSEE will evaluate the need for additional compensatory mitigation consistent with the Annual Certification under 30 CFR 285.633(a). BOEM does not anticipate long-term

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	mitigation plan must include a requirement that any funds not paid out directly to fishermen or shoreside services must be utilized for other mitigation opportunities such as seafood marketing research into fisheries methods gear research etc. Without this the compensation plans combined with the loss of the ability to fish in the areas have the effect of reducing the value of a permit and the attractiveness of commercial fishing as an occupation to any new generation of fishermen. Finally any financial mitigation plan must include the ability of BSEE to require additional funds to be deposited should it become apparent that such funds are necessary to mitigate the impact from the areas.	closures in any given lease area aside from those required for safety during active construction or maintenance activities. COMFIS-7, a new RP developed in response to comments received on the Draft PEIS, encourages lessees to consider participating in a Fisheries Compensation Fund. Furthermore, BOEM does not preclude the lessees of the NY Bight from using a regional fund administrator, provided the requirements set forth from BOEM are met. BOEM recognizes the advantages of a single fund, yet also recognizes that a lessee may prefer to better set the terms of a fund for their individual project. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.
BOEM-2024-0001-0444-0011	G-42 At the outset of the comments on the potential NY Bight lease areas there were comments regarding transit corridors. Are such corridors still contemplated? COMFIS-3 is commendable but not sufficient to address the potential issues involved. As indicated in the data put forward in the PEIS scallops are by far the most lucrative catch in the area and the catch around the NY Bight represents a significant portion of the scallop fishery as a whole. The PEIS acknowledges that the scour protection will introduce habitat in prime sandy bottom scallop habitat that did not previously exist. It further acknowledges that such rocky habitats could host scallop predators. The problem is that there does not appear to be any plan as to how to respond to issues that may arise as a result of the scallop monitoring. The problems identified by the scallop fishery involve concerns about turbidity scour pads currents OSS cooling recruitment etc. Absent addressing the concerns in the design and construction of the WEA it is difficult to see how BOEM intends to respond to negative impacts on scallop populations that arise in the monitoring plan.	Thank you for your comment. Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan, which still includes scallops. Adaptive management as a result of COMFIS-3 monitoring will be considered on a case-by-case basis. As indicated in COMFIS-3, if the monitoring results deviate substantially from the anticipated impacts, the lessee is encouraged to propose new mitigation measures or monitoring methods, or both, to BOEM and BSEE for review and concurrence. BOEM retains the authority to review a COP and require a revision if circumstances change.
BOEM-2024-0001-0444-0012-a	Furthermore we support [bold and italicized: (MUL-26)] and [bold and italicized: (OU-7)] Monitoring Plan and Federal Survey Mitigation Program and urge BOEM to be as thorough and consistent when it	Thank you for your comment. Monitoring plans are developed as a result of project-specific ESA and EFH consultations.

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	comes time for the development of individual project DEIS construction and operations plans. [Bold and italicized: MUL-26] is a great addition to the procedures required under an EIS and COP. The language should include a requirement that Lessees put forward a plan to address any issues in connection with the required monitoring. Although it may be implied there should be a requirement that the results of such monitoring efforts be public and provided to BSEE and a note that BSEE retains the right to amend any COP or EIS requirements in response to the monitoring. We are also encouraged that compensatory mitigation includes compensation to shoreside businesses for losses associated with project development. These compensation and monitoring programs although not specifically noted shall be required for the entire life of the project and have begun to be addressed in recent BOEM's DEIS's.	
BOEM-2024-0001-0444-0012-b	[Bold and italicized: BEN-2] should contain a requirement that to the extent possible scour pads will be removed from habitat that was sandy bottom before the installation of the WEA. The restoration of the seafloor must be to the condition prior to installation or the damage done to the preexisting ecosystem will be permanent. This would apply to COMFIS-2 as well.	BEN-2 has been renamed MUL-41 because it is a technical requirement that does not mitigate impacts on benthic resources. Instead, it is to monitor scour protection for the integrity of the infrastructure. Scour protection typically will not be removed prior to installation of the offshore wind project and scour protection typically will stay in place for the life of the project. Lessees can request that facilities remain in place in the decommissioning application submitted to BSEE (30 CFR 285.900-285.913), but BOEM approves or does not approve the request (30 CFR 585.434).
BOEM-2024-0001-0444-0012-c	[Bold and italicized: COMFIS-4] contains several "recommendations" Is there a reason these measures are not required? A static cable depth of 2 feet in scallop areas is insufficient. From our conversations with scallop fishermen they are unlikely to take their scallop dredge into an area where the cable depth is only 2 feet as they do not feel comfortable with so little separation between their dredge and the cable especially where the seafloor conditions are constantly changing. We have also heard that the insurance companies insuring the vessels are equally unsure of scallop fishing within the WEA. At a minimum BOEM should require that inter-array cabling is laid out to minimize crossings in the line of orientation for the towers. As the	Thank you for your comment. Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.

Comment No.	Comment	Response
	WEA is laid out with a predominant trawl direction in mind it only makes sense to require that inter-array cabling minimizes the chances of conflict between a trawl and the cables. There also needs to be a discussion as to the need for either closed-loop OSS cooling or a reduction in the use or volume of cooling water during times identified by NMFS as critical to scallop larval development.	COMFIS-4 is an RP and burial is recommended at 3 feet below stable seabed as the minimum. Actual depths will be determined at the project-specific phase. Export cable burial depth of 3 to 19.6 feet (0.9 to 6 meters) is the anticipated potential range of burial depth; 6 feet (1.8 meters) is typical target burial depth. Depths may vary based on site-specific factors (e.g., soil type, cable/pipeline crossings, crossing of navigation channels or other federal civil work projects, other federal or state requirements). COMFIS-4, Fisheries mitigation, came directly from the draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585 (https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf). BOEM's ultimate recommendations will follow the Final Fisheries Mitigation Guidance once completed. Project-specific details will be analyzed during the COP NEPA stage.
BOEM-2024-0001-0444-0013	We urge BOEM to reassess mitigation measures alternatives avoidance and minimization methods economic and habitat impacts and other environmental and operations concerns especially relative to the valuable scallop fishery and its operations.	Additional avoidance, minimization, and mitigation will be considered and applied during project-specific EFH consultations. Additionally, economic impacts on scallop fisheries can be addressed through compensatory mitigation (COMFIS-6).

P.5 Responses to Other Agency, Stakeholder, and Public Comments on the Draft PEIS

P.5.1 Purpose and Need

Table P.5-1. Responses to Comments on the Purpose and Need

Comment No.	Comment	Response
BOEM-2024-0001-0089-0001	The NY EIS should be discarded as submitted. There are numerous instances where knowledge gaps exist that are dismissed as inconsequential to the project. Examples include gaps in knowledge of EMF emissions impacting benthic layers and the authors suggest that ongoing studies taking place at Block Island Wind Farm which has consistently operated at a fraction of its stated capacity or not at all should suffice as evidence that the project should forge ahead. This is IRRESPONSIBLE!	The EMF and cable heat IPF discussion under Section 3.5.2.3, *Impacts of Alternative A – No Action on Benthic Resources*, does include a discussion of the differences between HVAC and HVDC and the type and intensity of the EMF they produce. Text has been added to this section and Section 3.5.2.5 stating that cable shielding required by BOEM would block electric fields emitted by HVDC and HVAC cables and that a weak induced electric field would be present if HVAC cables are used. Both sections discuss the impacts of any remaining EMF on benthic invertebrates. In addition, refer to response to comment BOEM-2024-0001-0400-0003 regarding data gaps, uncertainties, and incomplete and unavailable information. BOEM addresses this concern for each resource as required under CEQ regulations (40 CFR 1502.21) in PEIS Appendix E: *Analysis of Incomplete and Unavailable Information*. For NEPA purposes, BOEM believes the NEPA regulatory requirements regarding incomplete and unavailable information have been satisfied in the PEIS.
BOEM-2024-0001-0175-0004	[Bold: BPA:] I encourage you to read [Underline: The Toxic Wings - Damage and casualty of wind turbine blades] First English edition (May 2023): Jan Erik Weinbach Asbjrn Solberg og Brd-Einar Rimereit. THE TURBINE GROUP May 2023. The author states: "The entire western world has enumerated and adopted gigantic development targets with this unproven technology and that without having a scientific basis for the overall scope of consequences for HSE (health safety and environment). It is almost unbelievable and we know of no other industry that have been allowed such "Wild West" conditions ever. The closest we come to historical comparisons is to the tobacco industry which for many decades was allowed to advertise that cigarettes were good for life and health even long after it was widely known that cigarettes have a very negative effect	Each lease area will undergo project-specific environmental analyses through the development and submittal of an SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. Calculation of rates is outside the scope of the PEIS and is the responsibility of grid operator and state.

Comment No.	Comment	Response
	on life and health. Smoking cigarettes was an individual choice and the damage caused by these was largely self-inflicted. The toxic emissions from wind turbines are imposed on each and every one of us including the voiceless creatures of nature. The responsibility for this must and will be assigned to those who imposed this on us without a scientific basis about the consequences for life and health". There will be too many negative and irreversible impacts for the limited amount of energy we would get from offshore wind. The benefit will never out measure the costs. Lastly I would like to mention that to date the BPU cannot tell the ratepayers what will be our cost for this venture since offshore wind is built on subsidies which I believe is not economically responsible. I truly hope that you don't realize what will be lost until after it is gone.	
BOEM-2024-0001-0310f	A smaller pilot trial project would be more prudent and give all of us a chance to assess its environmental safety and energy generating efficiency.	BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project-specific COPs and EISs.
BOEM-2024-0001-0310i	But one of the things I think that is not included in a lot of the BOEM documents is the fact that this industry is not going to produce enough energy for the big cities. The wind turbines does not produce enough energy for the MTA in New York City, for the police, for the Homeland Security, for the hospitals. Wind blows 38 percent of the time. What are you supposed to do for the rest of the time? You have 24/7 backup with the industry that they are saying, you know, you know, reducing. They're actually increasing the oil industry and gas, because we need all this backup because this industry cannot do the job.	Thank you for your comment. BOEM expects that offshore wind development in the NY Bight lease areas would lead to reductions in fossil fuel usage in the U.S. However, the wind turbines would not be a sole source of electricity to the electrical grid; other sources of electric generation—including both renewables and fossil fuels—are connected to the electrical grid and would continue to supply electricity in the event that the wind turbines are shut down for any reason.
BOEM-2024-0001-0310l	The problem with offshore windmills is they're expensive. According to the Energy Information Administration, offshore wind is the most expensive energy resource in our repertoire based on the level cost of energy. The 2002 estimate for offshore wind absent of any government subsidies is $136 per megawatt of electricity. How are we the people of New York and New Jersey going to afford our electric bills? Thank you.	Thank you for your comment. The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state's offshore wind procurement laws and regulations.

Comment No.	Comment	Response
BOEM-2024-0001-0310m	There's one other thing. I actually wanted the audience to know, but I want to BOEM to know too. This isn't your fault. You're given the task of working with the prospect of offshore wind. And so ahead of that somebody decided to do offshore wind, and the cost of the project and its benefits have been shrouded in mystery and the mystery is starting to clear and the curtain is starting to get drawn back and people are starting to understand the cost figures per person, per home. When we're told and you allow a certain wind farm or a set of wind farms to be built, we're told how many homes that would serve with electricity. We're not told what it costs per home to provide that. 'Cause that cost is on our backs. It shows up in our taxes and in our electric rates eventually. We have to pay all that back to the wind builders. We have to give them their profit they're guaranteed. So I will leave it at this. You can talk to me in the back if you're interested, but what it's showing is that it costs so much money per home that this would serve that for a tiny fraction, that's the cost to build, maintain the whole lifespan and if we add to that also the losses that we know that the seashores will come to, which includes the fisheries, it includes property value losses, the loss to the shore businesses. When you add all that up divided by the number of homes that that's supposed to provide electricity for, it's such a huge number that you could easily come up with alternatives.	Thank you for your comment. The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state's offshore wind procurement laws and regulations.
BOEM-2024-0001-0310p	I have been involved with many of the anti-wind and pro whale groups in the area, I have not found one fact that can support that there's anything good about these offshore wind turbines going in. Not one. If anybody knows of one, please educate me because I have read environmental impact studies and one of the main things that I would like to request from BOEM is to complete your mission statement. Your mission is to environmentally and economically manage our ocean, and by putting in these wind turbines and rushing them through without, you know, without the studies on how it's affecting the marine life and the ocean and the economy, is just irresponsible. You're not meeting your mission statement. So, BOEM, I would like you to meet your mission statement and be	BOEM's Environmental Studies Program develops, funds, and manages rigorous scientific research specifically to establish information needed for assessing and managing environmental impacts of energy and mineral development on the human, marine, and coastal environments. For more information on this program, please visit https://www.boem.gov/environment/how-we-do-research. Further, BOEM's Office of Renewable Energy Programs depends on science to meet its responsibilities under environmental laws, regulations, and standards. As such, BOEM funds and manages scientific research to inform its decision-making processes for

Comment No.	Comment	Response
	environmentally and economically prudent with our ocean. We've only got one. If we ruin it this is going to be the worst environmental disaster in our lifetime, you know, worse than the polar icecaps and the dinosaurs missing and all that stuff. We cannot get clean water back.	renewable energy projects on the OCS. For more information on Office of Renewable Energy Programs, please visit https://www.boem.gov/environment/environmental-studies/renewable-energy-research.
BOEM-2024-0001-0313-0006	1.3 Purpose and Need for the Proposed Action Page 1-5 states that "A broader approach to the NEPA analysis for the minimum of six COPs expected for the NY Bight lease areas is consistent with Executive Order 14008 "Tackling the Climate Crisis at Home and Abroad" issued on January 27 2021. In that order President Biden stated that the policy of his administration is "to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands waters and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth especially through innovation commercialization and deployment of clean energy technologies and infrastructure." To support the goals outlined in Executive Order 14008 the administration has also announced plans to increase renewable energy production with a goal of 30 gigawatts (GW) of offshore wind energy capacity by 2030. Potential development of the leaseholds would assist with meeting several state mandates for renewable energy. New Jersey's goal of 11 GW of offshore wind energy generation by 2040 is outlined in New Jersey Executive Order No. 307 issued on September 21 2022. New York's requirement of 9.0 GW of offshore wind energy generation by 2035 is outlined in the Climate Leadership and Community Protection Act signed into law on July 18 2019. Additionally an estimated 1618 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022). Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy."	The PEIS only analyzes six lease areas on the Atlantic OCS; other projects not analyzed in the PEIS would contribute to New Jersey and New York state goals. These include Empire Wind, Atlantic Shores North, and Atlantic Shores South. These other projects are analyzed as part of the cumulative effects analysis. The 5–7 GW expected from the six NY Bight lease areas is based on a conservative power ratio of 3 megawatts per square kilometer (MW/km^2). The NY Bight leases each have operations terms of 33 years that commence on the date of COP approval. Lessees may request an extension of their lease in accordance with lease terms and BOEM regulations. Cumulative impacts are addressed in the PEIS for each resource and for each alternative, including the No Action Alternative; the methodology is explained in PEIS Chapter 3, pages 3-1 through 3-3.

Comment No.	Comment	Response
	Comment: It is unclear how dedicating 48800 acres of lease area and the associated structures and disturbance meets the objectives specifically protection of public health; conservation of our lands waters and biodiversity stated above; in fact this project appears to directly contravene those policies. For context the entire Town of Oyster Bay comprises approximately 108 400 acres. The best-case scenario presented in the PEIS at full optimization of the project at 7GW is still less than the overly ambitious state mandate of 9GW of offshore wind energy further the lifespan of a WTG is only approximately 30 years. There is no discussion about the net generation of how these mandates will be achieved and how that figure is calculated into the equation upon expiration of the WTG's useful lifespan not only would it appear that a lease extension would be needed for continuous operation but WTGs would have to be decommissioned and replaced. The larger plans of scale and cumulative impacts must be adequately addressed in the final PEIS. Though the goals for alternative energy requirements are reiterated throughout the documents as a guiding qualifier for expeditiously proceeding with the review of these projects the details are omitted and unavailable thereby making it impossible to meaningfully review and consider the comprehensive cumulative synergistic direct and indirect impacts.	
BOEM-2024-0001-0331-0001	We are not opposed to clean energy in general and seek only that where it is pursued it be done in a reasonable and consistent manner and not leave major collateral damage in its wake. According to the Federal Register BOEM states that the purpose of the Draft PEIS is to analyze the potential impacts of the New York Bight along with identifying possible changes to those impacts that could result from adopting certain avoidance minimization mitigation and monitoring measures (AMMM). After public input BOEM will decide on whether to adopt one or all of the AMMM measures outlined in the DPEIS and make them conditions of approval for activities proposed by the lessees in their construction and operation plans (COPS) or defer the decision to adopt such measures to each project-specific environmental review. According to the diagram about the process the PEIS analyzes the programmatic avoidance minimization mitigation and monitoring measures that could apply to the New	Thank you for your comment. BOEM shares the same goal to ensure projects are developed responsibly. The Final PEIS includes several identified AMMM measures (refer to Appendix G) to avoid, minimize, and mitigate impacts from potential development of the six NY Bight lease areas.

Comment No.	Comment	Response
	York Bight leases and includes a focused regional cumulative analysis.	
BOEM-2024-0001-0331-0030	The BOEM PEIS lacks any discussion concerning intermittent offshore wind's contribution to grid unreliability how this will be mitigated and at what cost. For the first time in August 21 2023 the North American Electric Reliability Corporation (NERC) identified energy policy as a risk priority for grid reliability because the heightened legislative focus and mandates regarding decarbonization decentralization and electrification. The organization holds that the emerging resource mix is more susceptible to long-term widespread and extreme events like sustained loss of wind power. (https://www.nerc.com/news/Pages/Collective- Focus-Imperative-for-Mitigating-Emerging-Risks-to-Grid-Reliability.aspx) If the purpose of the projects is to meet the governor's goal by executive order for the State to sell 100% clean energy by 2035 including 11 GW of offshore wind how do the wind developers and BOEM propose to back up the wind when it is not blowing? What is the cost of this backup? What are the plans and cost of battery backup storage systems? According to Science Daily "energy droughts" in wind and solar can last a week. (DOE/Pacific Northwest National Laboratory December 11 2023) . BOEM and wind developers use a misleading measurement called a capacity factor in their discussions of offshore wind energy output but this number typically 50% - is misleading in that it is an average. This average does not account for the times when generated wind energy exceeds demand and when wind energy is less than demand. For example there could be days when the wind turbines are only producing 20% of their energy capacity but demand requires 80% capacity. There will be other days when wind energy supply will be at 70% of its capacity but demand will only be at 50%. A rigorous multiyear supply/demand accounting would inform us of the balancing costs back-up costs and grid costs related to the true issues of intermittency.	BOEM's responsibility under the Energy Policy Act of 2005 is to issue renewable energy leases, easements, and rights-of-way (ROWs) for activities on the OCS. The purpose of the PEIS is to present a programmatic analysis of the six NY Bight lease areas to characterize the types of impacts that could occur and mitigation measures that could minimize those effects. Grid reliability is outside of BOEM's regulatory authority and the scope of the PEIS. The grid operator is responsible for managing the reliability of the grid. While offshore wind in the NY Bight would provide a new source of energy to the states of New York and New Jersey, other sources of energy would still be generated. BOEM's calculations of capacity are an assessment of total lease capacity and are not used to estimate power operations. Costs for power are considered through state solicitations and are factored into utility rates. To date BOEM has not received COPs proposing battery energy storage systems. Other developers may choose to develop battery systems to capture offshore wind, and those projects would be required to be reviewed and permitted separately, although they would be outside BOEM's jurisdiction. However, the offshore wind projects do not require backup power or battery storage systems, and each project has independent utility.
BOEM-2024-0001-0334-0002	Be advised that the issues below as well as those you will receive from others represent a grave concern regarding BOEM's performance in protecting the interests of the New Jersey public. BOEM appears to ignore most of the significant impacts raised in their own EIS documents as well as the concerns raised by the well-	The PEIS was developed through coordination with federal agencies, Tribal Nations, and state and local partners, and the AMMM measures seek to avoid, minimize, or mitigate potential impacts. Project-specific NEPA analysis will provide additional site-specific data and incorporate advances in technology and

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	researched public. The approvals of the projects to date seem to only ensure that the projects move forward with the appearance of having been fully vetted and the mainstream press bolsters that perception to the public. A critical viewpoint is now widespread and if successful will lead to new and increased pressures to prevent offshore wind projects from proceeding in New Jersey on the East Coast and around the coastal areas of the USA.	understanding of these areas. Additional coordination with regulatory agencies is required as part of the approval of the project-specific approaches.
BOEM-2024-0001-0345-0003	New York City and Long Island are on the front lines of climate change. The NYSERDA white paper on the Climate Leadership and Community Protection Act asserts that one major obstacle the state faces to meet our climate change goals is that there is a "tale of two grids." Upstate uses 88% zero-emission resources but only represents 1/3rd of the energy load while downstate is 2/3rds of the load and 69% fossil fuels. The only way to see a just transition from polluting fossil fuels to renewable energy downstate is by utilizing offshore wind. New York has several offshore wind projects moving through the regulatory process which if approved will power millions of homes with clean renewable energy and bring New York significantly closer to our goal of 9000 MW of offshore wind. These projects are also kickstarting an "offshore wind-ustry" in the state which are already slated to create nearly 7000 jobs in project development manufacturing installation and operations and maintenance while creating over $12 billion in economic benefits to the state. They will also allow the state to close down antiquated polluting fossil fuel fired power plants which will improve air quality in our region and provide $1 billion in health benefits to New Yorkers in vulnerable and frontline communities.	Comment noted.
BOEM-2024-0001-0354-0017	True science involves constantly emerging new evidence and findings along with the ever-changing challenges imposed as to prior conclusions. As such contrary to the. Non-scientific "group think" and massive amounts of money driven public relations press releases behind the current wind turbine projects such sentiment ignores scientific methods of ongoing experimenting at the very least through realistic peer reviewed scientific pilot projects. True science involves constantly emerging new evidence and findings. This process necessarily continually involves the ongoing application of extensive scientific research which is then applied to the previously	This PEIS highlights regional issues; the details in the project-specific COP NEPA documents will provide additional site-specific information and incorporate advances in technology and scientific understanding as the projects advance. In addition, refer to response to comment BOEM-2024-0001-0400-0003 regarding data gaps, uncertainties, and incomplete and unavailable information. BOEM addresses this concern for each resource as required under CEQ regulations (40 CFR 1502.21) in PEIS Appendix E: *Analysis of Incomplete and Unavailable Information*. For NEPA purposes, BOEM believes the

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	accepted theories. Such a true application of peer reviewed science especially applied to growingly_ obsolete wind turbine construction would support the revision if not rejection of prior dogma as to allegedly "settled science". As I have testified previously only from a partially facetious standpoint the rush to judgment approach as to this specific proposal to construct massive windfarms off New Jersey represents non-scientific "group think" with the devastating potential to trample upon scientific inquiry and research. Such immense pressure from those supporting such colossal development of this offshore industrial site off of the precious New Jersey Coast unfortunately has facilitated many knee-jerk feel-good reactions which totally ignore the required economic and scientific vetting process. During a prior era particularly relevant to the coast of New Jersey our town and I were subjected to enormous pressures exerted by those supporting ocean dumping. Generated by a foreign corporation's pipeline off our beautiful and incalculably valuable portion of the New Jersey shore. Similar subconscious and actual influences are once again being exerted in favor of a foreign corporation looking to create another potential ocean dumping site off New Jersey's shoreline. I would truly beseech BOEM officials to rise above the narrow bureaucratic rubber-stamping of the within proposal in favor of the true application of scientific method to the entire cumulative and indirect impacts of the current project as well to windfarms off of New Jersey's Coast in general. Just as one heartfelt objector testified in a virtual hearing as to the threats proposed by foreign corporations to our country's national symbol the bald eagle these threats are very real whether proposed by a non-American entity or a corporation based in our own country.	NEPA regulatory requirements regarding incomplete and unavailable information have been satisfied in the PEIS.
BOEM-2024-0001-0355-0004	Unreliable energy so a back-up energy supply would still be needed.	Comment noted. Grid reliability is the responsibility of the state grid operators. While offshore wind in the NY Bight would provide a new source of energy to the states of New York and New Jersey, other sources of energy would still be generated.
BOEM-2024-0001-0355-0017	In addition it seems BOEM is rushing this process with little or no information. I am opposed to approval of the OSW projects at this time until MORE DATA AND MORE STUDIES are conducted. There are way too many unknowns and "insufficient data" per BOEMs PEIS. From p. 5 of the PEIS they state "The Atlantic OCS is considered by	Refer to response to comment BOEM-2024-0001-0400-0003 regarding data gaps, uncertainties, and incomplete and unavailable information. BOEM addresses this concern for each resource as required under CEQ regulations (40 CFR 1502.21) in PEIS Appendix E, *Analysis of Incomplete and Unavailable*

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	BOEM to be a "Frontier Region" where little information exists about the geologic conditions and how those conditions may impact development of offshore wind farms." On page 12 they state "site investigation and characterization for such projects is generally focused on a limited area." Does this make sense on a barrier island where the water table is high and you can compromise the water resource on one part and not another? How can you approve such a project without knowing so much of the necessary information to make a thoughtful decision that will affect SO MANY humans and marine creatures in multiple negative ways? At the very minimum there should be a pilot study done to collect more information on our specific region before going for this massive disruption to and destruction to marine life human life real estate and tourism.	*Information*. For NEPA purposes, BOEM believes the NEPA regulatory requirements regarding incomplete and unavailable information have been satisfied in the PEIS. In addition, this PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lease holder is required to conduct project-specific environmental analyses, which include development and submittal of a COP as required under 30 CFR 585.628. BOEM will conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures for each resource area discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area and cable route as the projects advance. Further, BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project specific COPs and EISs.
BOEM-2024-0001-0356-0003	The second more recent information that has been acknowledged is inadequate is from the NJBPU published 2/14/24: "Atlantic hurricanes pose a significant potential threat to the State's burgeoning OSW sector. Despite this risk relatively little technical research has been devoted to quantifying and assessing Atlantic hurricane impact upon OSW projects. As a result regulators developers and insurers have limited tools at their disposal to mitigate this risk or ascertain whether the risk warrants design modifications. The prevailing uncertainty surrounding what is widely perceived as a substantial threat to OSW largely without scientific or engineering backing serves as a considerable obstacle to the development of OSW Development of advanced technical research quantifying and assessing hurricane risk is therefore necessary to aid developers regulators and insurers in mitigating hurricane risk and providing improved design standard baselines." These studies	As stated in PEIS Section 2.3, the engineering specifications of the WTGs and their ability to sufficiently withstand weather events, including hurricane-level events, are independently evaluated by a certified verification agent when reviewing the Facility Design Report and Fabrication and Installation Report according to international standards. One of these standards calls for the structure to be able to withstand a 50-year return interval event. An additional standard includes withstanding 3-second gusts of a 500-year return interval event, which would correspond to Category 5 hurricane windspeeds. It is in the best interest of the lessees to construct and operate a viable project and minimize risk as much as possible; they are responsible for ensuring the WTGs are designed and constructed to withstand such events and to ensure the integrity of the structures would not be compromised.

Comment No.	Comment	Response
	should've been performed and the results published long before any of the EIS's for any lease were approved. This is absolutely absurd and are yet more glaring reasons that OSW is being pushed through the regulatory processes prematurely and unchecked.	
BOEM-2024-0001-0357-0002	As requested by the BOEM the bulk of our comments here are on the New York Bight program EIS to make it a more useful document. However it is not the document that is of paramount concern here. Rather it is the BOEM decision making process itself relative to the requirements of the Administrative Procedures Act the Outer continental Shelf Lands Act and the National Environmental Policy Act and the dictates of common sense which we believe is fundamentally unreasonable and flawed in at least two major respects: First, the BOEM does not consider the full, real environmental impact to an area when it approves projects, and Second, it does not engage expert and other public input before it makes the most important decisions, i.e., on wind turbine location, number, megawatt size and gear drive. Both of these defects are discussed below.	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project, including cumulative effects. During the COP-specific NEPA process, BOEM will hold a public comment period at the start of the NEPA process (scoping) and, following that, will release the Draft NEPA document, whereby members of the public and agencies can provide input to help inform the NEPA process, alternatives, and mitigation measures to identify and minimize environmental effects. Additionally, throughout the NEPA process, BOEM will work closely with Cooperating Tribal Governments and federal and state agencies to assist with assessing impacts and identifying mitigation measures. BOEM will analyze each COP as proposed by the developer and does not make decisions on number of turbines, MW size, and gear size that applicants include in the COP. BOEM may analyze different alternatives and mitigations—such as the number of turbines, MW size, and gear size—as part of the NEPA review process, project-specific consultations, and decision process.
BOEM-2024-0001-0362-0027	High-road Equitable Environmentally Responsible Development Outer Continental Shelf Lands Act BGA believes that standards for high-road equitable and environmentally responsible development are consistent with federal statute. In Section 8 of OCSLA Congress declared that it is the authority of the Secretary of the Interior (delegated to BOEM) to "grant a lease easement or right-of-way" for activities that "produce or support production transportation or transmission of energy from sources other than oil and gas" in a	Comment noted. Section 1.4, *Regulatory Overview*, of the Final PEIS describes the regulatory authority for renewable energy leasing on the OCS.

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	manner that provides for:"(A) Safety;(B) Protection of the environment;(C) Prevention of waste;(D) Conservation of the natural resources of the Outer Continental Shelf;(E) Coordination with relevant Federal agencies;(F) Protection of national security interests of the United States;(G) Protection of correlative rights in the Outer Continental Shelf;(H) A fair return to the United States;(I) Prevention of interferences with reasonable uses of the exclusive economic zone the high seas and the territorial seas;(J) Consideration of a. The location of and any schedule relating to a lease easement or right-of- way for an area of the Outer Continental Shelf; and b. Any other use of the sea or seabed including use for a fishery a sea lane a potential site of a deep-water port or navigation;(K) Public notice and comment on any proposal submitted for a lease easement or right-of-way under this subsection; and(L) Oversight inspection research monitoring and enforcement related to a lease easement or right-of-way under this subsection." [Footnote v: U.S. Code 1337 - Leases easements and rights-of-way on the outer Continental Shelf. https://www.law.cornell.edu/uscode/text/43/1337] High road standards touch on many of these imperatives including safety; protection of the environment; conservation of natural resources; protection of national security; fair return to the United States; consideration of other uses; and oversight inspection and resource monitoring. Environmentally responsible development robust stakeholder engagement equitable distribution of benefits and attention to quality job creation domestically are all foundational to OCSLA requirements. In addition to the authority granted to BOEM to facilitate energy development on the Outer Continental Shelf (OCS) the president has authority to direct requirements on leases of the OCS and precedent exists for the president to do so. Current BOEM leases include terms mandated by presidential Executive Order 11246 which prohibits employment discrimination and establishes affirmative action requirements for nonexempt federal contractors and subcontractors. [Footnote vi: DOL Executive Order 11246 Equal Employment Opportunity Sept. 24 1965. https://www.dol.gov/agencies/ofccp/executive-order-11246/as-amended] Article II 1 of the U.S. Constitution provides that	

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	"executive power shall be vested in" the president. Such power gives the president the right in the absence of an express congressional declaration to the contrary to control the terms upon which public lands or property may be sold leased or used by private individuals or entities. [Footnote vii: Case text United States v. Midwest Oil Co. Feb. 23 1915. Available online: https://casetext.com/case/united-states-v-midwest- oil-co]	
BOEM-2024-0001-0362-0028	In Executive Order 14008 Tackling the Climate Crisis at Home and Abroad issued January 27 2021 President Biden stated that it is the policy of the United States: "to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands waters and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth especially through innovation commercialization and deployment of clean energy technologies and infrastructure." This executive order further emphasizes that "[t]his Nation needs millions of construction manufacturing engineering and skilled-trades workers to build a new American infrastructure and clean energy economy." [Footnote ix: White House Executive Order on Tackling the Climate Crisis at Home and Abroad Jan. 27 2021. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at- home-and-abroad/] President Biden further states "Agencies shall seek to increase the Federal Government's resilience against supply chain disruptions. Such disruptions put the Nation's manufacturing sector at risk as well as consumer access to critical goods and services." Additionally President Biden directed all agencies to "adhere to the requirements of the Made in America Laws in making clean energy energy efficiency and clean energy procurement decisions" consistent with Executive Order 14005 Ensuring the Future Is Made in All of America by All of America's Workers. [Footnote x: White House Executive Order on Ensuring the Future Is Made in All of America by All of America's Workers Jan. 25 2021. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/25/executive-order-on-ensuring-the-future-is-	Comment noted. Section 1.3, *Purpose of and Need for the Proposed Action*, describes the purpose of the Proposed Action, which supports Executive Order 14008 “Tackling the Climate Crisis at Home and Abroad.”

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	made-in- all-of-america-by-all-of-americas-workers/] President Biden has also emphasized the need to maximize utilization of domestic content as we advance climate and clean energy solutions in order to strengthen U.S. manufacturing. President Biden's executive order on America's supply chains issued February 24 2021 states "[t]he United States needs resilient diverse and secure supply chains to ensure our economic prosperity and national security." It continues to say "resilient American supply chains will revitalize and rebuild domestic manufacturing capacity maintain America's competitive edge in research and development and create well-paying jobs. They will also support small businesses promote prosperity advance the fight against climate change and encourage economic growth in communities of color and economically distressed areas."	
BOEM-2024-0001-0362-0029	Executive Orders on Domestic Manufacturing Environmental Justice and Union Labor President Biden has reinforced in various executive orders that it is the policy of the federal government to pursue solutions to the climate crisis with attention to union labor domestic manufacturing environmental justice and protection of natural resources. The announcement of the national offshore wind target to deploy 30 gigawatts (GW) of offshore wind by 2030 further underscored this approach. The White House fact sheet containing that announcement declared: "The President recognizes that a thriving offshore wind industry will drive new jobs and economic opportunity up and down the Atlantic Coast in the Gulf of Mexico and in Pacific waters. The industry will also spawn new supply chains that stretch into America's heartland as illustrated by the 10000 tons of domestic steel that workers in Alabama and West Virginia are supplying to a Texas shipyard where Dominion Energy is building the Nation's first Jones Act compliant turbine installation vessel. "Federal leadership in close coordination with states and in partnership with the private sector unions and other key stakeholders is needed to catalyze the deployment of offshore wind at scale. "the Administration is taking coordinated steps to support rapid offshore wind deployment and job creation:1. Advance ambitious wind energy projects to create good-paying union jobs2. Investing in American infrastructure to strengthen the domestic supply chain and deploy offshore wind energy3. Supporting critical research and data-	Comment noted. Section 1.3, *Purpose of and Need for the Proposed Action*, describes the purpose of the Proposed Action, which supports President Biden administration's goal of 30 GW of offshore wind capacity by 2030.

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	sharing." [Footnote viii: White House FACT SHEET: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs March 29 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts- offshore-wind-energy-projects-to-create-jobs/]	
BOEM-2024-0001-0362-0031	Recent global events have made it abundantly clear that our national security is strongly tied to our energy security to which domestic manufacturing plays a critical role. The U.S. Department of Energy and the North American Electric Reliability Corporation jointly-commissioned a report assessing risks to the U.S. electricity generation and distribution infrastructure. The summary of the report observed that the "bulk power system is dependent on long supply chains often with non-domestic sources and links" and determined that the "increased reliance on foreign manufacturers with critical components and essential spare parts manufactured abroad (e.g. HV transformers)" means the "supply chain itself represents an important potential vulnerability." [Footnote xv: North American Electric Reliability Corporation High-Impact Low-Frequency Event Risk Impact to the North American Bulk Power System at page 30 (June 2010). https://www.energy.gov/ceser/downloads/high-impact-low-frequency-risk-north-american- bulk-power-system-june-2010.] The report recommends that "efforts should be considered to bring more of the supply chain and manufacturing base for these critical assets back to North America." [Footnote xvi: Ibid at 27]	Comment noted.
BOEM-2024-0001-0383-0007	OSCLA: BOEM quotes the Outer Continental Shelf Lands Act regarding the Secretary's legislative requirement to "ensure that any activity under [subsection 8(p)] is carried out in a manner that provides for (A) safety; (B) protection of the environment.. (I) prevention of interference with reasonable uses (as determined by the Secretary) of the exclusive economic zone the high seas and the territorial seas.." etc. [Footnote 21: PEIS at New York Bight Draft Programmatic Environmental Impact Statement Volume 1 Chapters 1-4 (boem.gov) p. 1-6 1-7.] The agency then quotes a 2021 agency memo that states that the law as written in fact does not require the Secretary to ensure achievement of these various "goals" but to balance them.[Footnote 22: Ibid p. 1-7.]We disagree. The term	The Solicitor’s Opinion of December 14, 2020, M-37059, was withdrawn on April 9, 2021, by M-37067 for the reasons explained in the latter opinion. The Solicitor’s M-opinions on matters within the jurisdiction of the Department of the Interior (DOI) are binding on BOEM (see 209 Department Manual 3.2(A)(11)). Therefore, BOEM is bound to follow the interpretation of the OCSLA put forth in M-Opinion 37607.

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	"ensure" means "ensure". It does not mean balance. By not ensuring safety by not ensuring prevention of interference with reasonable uses- such as federally permitted commercial fishing on the OCS- BOEM is in violation of the law. The agency cannot rewrite the meaning of the word "ensure" with an internal agency memo. Furthermore the agency memo written in 2021 directly contradicts a corresponding agency memo written only five months prior in 2020. We have attached that memo along with this comment. The 2021 memo purports to overturn the previous 2020 memo this reinterpretation coinciding with a change in Administration but the law cannot mean two different things. Simply because an Administration changes does not mean that the law changes. Congress changed nothing. The definition of the word "ensure" did not change in the English language between 2020 and 2021.BOEM cannot add words to statute that do not exist in the statute; it must take the legislative language at face value. The PEIS states that the law imposes only a "a general duty" and "does not require the Secretary to ensure that the goals are achieved to a particular degree" but allows the Secretary to "balance" what it refers to as "goals". These listed requirements are not goals; they are legal standards. The law says the Secretary must "ensure" that these legislative standards are met. The word "ensure" defined by Merriam-Webster means "to make sure certain or safe: guarantee." [Footnote 23: See Ensure Definition & Meaning - Merriam-Webster.] The Secretary must guarantee these standards. It is clear from the discussion on navigational impacts in the AMMM section below the commercial fishing impacts contained in our attached USCG comments as well as the lack of regulatory benchmarks regarding high resolution geophysical surveys discussed below- which requires stronger regulatory protections by both BOEM and NOAA when being conducted in the Gulf of Mexico by other offshore energy industries than in the Atlantic by offshore wind developers- that BOEM is not guaranteeing that these OSCLA standards are met.	
BOEM-2024-0001-0403-0002	The content of the PEIS is also grossly insufficient to account for the various impacts on nearly half a million acres of ocean land leased throughout the six lease areas: Bluepoint Wind Attentive Energy Community Offshore Wind Atlantic Shores Offshore Wind Bight	For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional

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	Invenergy Wind Offshore and Vineyard Mid-Atlantic. Tellingly the record $4.3 billion secured through these leases indicates that the profitability of these leases far outweighs any real assessment of the impacts and consequences of industrializing one of our last untapped and pristine natural resources. The PEIS by BOEM's own estimation anticipates 1103 wind turbines 22 offshore substations 44 offshore export cables of 1772 miles in length and 1583 miles of inter array cables between the six projects throughout the Bight. The document sites estimated impacts from negligible to major in a variety of areas but without citing sufficient baseline data due to the absence of such data. To issue a PEIS on the six lease areas without the existence of baseline data and "because the size and design of the NY Bight wind farms are unknown at this stage" is shortsighted grossly inappropriate and negligent. Unfortunately, further issuance of project-specific Environmental Impact Statements have been hamstrung by the federal 2020 NEPA rule change which will limit future EISs to 150 to 300 pages for "proposals of unusual scope or complexity". This means that we will never fully understand the impacts and will be to borrow a term from NMFS "building the ship while sailing it."	analysis that will be included in the COP-specific NEPA analysis for each lease area. Each lease area will undergo project-specific environmental analyses through the development and submittal of a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. BOEM has prepared several EISs for offshore wind projects within the required page limits and has not found that the page limits prevent a thorough analysis.
BOEM-2024-0001-0406-0008	BOEM's Proposed Action Violates NEPA and the APA BOEM's proposed action "the adoption of AMMM measures such that the potential impacts described in Alternative B may be avoided reduced or mitigated" Draft PEIS 2.1.3 (p. 2-16) would run afoul of both NEPA and the Administrative Procedures Act (APA) creating considerable legal risk for BOEM and jeopardizing the utility of its programmatic NEPA analysis if BOEM does not amend the proposed action in its Final PEIS. As BOEM describes it in the Draft PEIS the proposed action calls for "adopting programmatic AMMM measures that BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective." Draft PEIS 1.3 (p.1-4) (emphasis added). BOEM then states that "[t]he Record of Decision (ROD) for the PEIS will state which of the AMMM measures analyzed in the PEIS BOEM has committed to adopting and if not why they were not adopted." Id. This proposed action would establish for	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing a presumption at COP review that a lessee would need to rebut—but is identifying those AMMM

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	the six NYB lessees a presumption at COP review that BOEM will impose the full suite of AMMM measures from the Final PEIS on their projects unless the lessees can make a specific showing in their COPs that specific measures are not "warranted or effective." This approach unlawfully shifts the burden from BOEM to the lessee an approach which is legally problematic in at least two key respects.	measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0406-0009	BOEM's Proposed Action Inappropriately Imposes Substantive Obligations Through a Procedural Statute NEPA is a procedural statute requiring an agency to analyze the environmental impacts of a proposed federal action. 42 U.S.C. 4331. While the NEPA regulations obligate an agency to provide a "detailed discussion of possible mitigation measures" when preparing an EIS it does not impose "a substantive requirement that a complete mitigation plan be actually formulated and adopted." Robertson v. Methow Valley Citizens Council 490 U.S. 332 35152 (1989). Thus while BOEM has appropriately discussed in detail the AMMM measures that could be applied during COP-specific NEPA analysis any adoption of those measures must be done through substantive statutes that grant BOEM and other permitting agencies the authority to require such measures. In this case BOEM's substantive authority to impose mitigation measures derives from the Outer Continental Shelf Lands Act (OCSLA) and its implementing regulations. In particular 30 CFR 585.620-628 establishes the COP review process and states that BOEM "will prepare an appropriate NEPA analysis" id. At 628(b) and then "upon completion of technical and environmental reviews will specify terms and conditions to be incorporated into the COP." Id. At 628(f)(1). Because BOEM's authority to impose mitigation measures is explicitly contingent on its review of a submitted COP it would be premature to invoke that authority in a PEIS. Moreover as noted above many of the proposed AMMM measures lie outside of BOEM's statutory and regulatory authority and would need to be "adopted" by other federal state and/or local agencies (if indeed they could be required or enforced at all). By proposing to "adopt" AMMM measures in a programmatic NEPA document divorced from an OCSLA decision point BOEM effectively and illegally converts NEPA to a substantive statute.[Footnote 1: It is no defense that BOEM would retain the discretion to not impose particular AMMM measures if	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing any substantive obligations at this programmatic stage—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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	lessees can demonstrate in their COPs that an "adopted" measure is not "warranted or effective." The proposed action still would constitute a substantive imposition of AMMM measures before COP submittal with the burden now shifted to lessees to prove in their COPs that such measures should not be required.]	
BOEM-2024-0001-0406-0010	BOEM's Proposed Action Appears to Constitute a De Facto Rulemaking in Violation of the APA By imposing a new standard of review on all projects within the NY Bight BOEM has also effectively engaged in de facto rulemaking in violation of the APA. Subject to very limited exceptions the APA requires that any adoption of or amendment to a federal regulation go through the notice and comment rulemaking process. 5 U.S.C. 553. Substantive agency rules which change or impose rights and obligations of regulated parties may not be imposed through informal pronouncements; to do so represents a violation of the APA's rulemaking procedure. See e.g. Cmty. Nutrition Inst. V. Young 818 F.2d 943 946-47 (D.C. Cir. 1987); see also Phillips Petroleum Co. v. Johnson 22 F.3d 616 621 (5th Cir. 1994) ("A party may not be adversely affected by a [substantive] rule in violation of [APA notice and comment] requirements."). BOEM's proposed action while not styled as an amendment to its regulations imposes a new standard that upends the COP review process established in BOEM's existing regulations and seeks to apply a new set of requirements (i.e. the full suite of AMMM measures) to all offshore wind projects in the NY Bight. As noted in the section above BOEM's regulations require that it "specify terms and conditions" of COP approval "upon completion of technical and environmental reviews" of a submitted COP. 30 CFR 585.628(f)(1). If the ROD is issued as BOEM proposes all six NYB lessees would face a presumptive array of requirements prior to submitting a COP and prior to BOEM conducting any of its environmental or technical reviews of those COPs. The lessees would then be required to demonstrate in their COPs that individual measures are not "warranted or effective" a standard found nowhere in OCSLA or BOEM's regulations. This would create a new standard of review that effectively shifts BOEM's burden to demonstrate that specific AMMM measures are needed based on its review of the project to the lessees. That is exactly the type of	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Nor does the proposed action purport to change the standard in BOEM's regulations governing review of COPs. For those reasons, the proposed action is not a de facto rulemaking. Instead, it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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	change in the rights and obligations of regulated parties that can only be done through notice and comment rulemaking.[Footnote 2: The fact that this particular Draft PEIS "only" applies to six lessees is of little consequence. BOEM is in the process of conducting a similar programmatic review for its five California leases see https://www.boem.gov/renewable-energy/state-activities/california-offshore-wind-programmatic-environmental-impact and has given every indication that it will continue to use the PEIS mechanism to create efficiencies in its future COP reviews. It is reasonable to expect that the choices BOEM makes in this PEIS process will inform subsequent programmatic reviews in other wind energy areas.	
BOEM-2024-0001-0406-0029	Finally BOEM should also consider declining to issue a ROD with the Final PEIS. Even in its draft form the PEIS does not make any "decisions" that trigger environmental effects and that remains the case if revised as suggested herein. No decision of that sort is made until BOEM makes a decision on an individual COP that has been the subject of a full-blown EIS. Any decision flowing from this PEIS is therefore premature. Moreover there is no formal requirement in NEPA the CEQ regulations or Department of the Interior (DOI) regulations that a programmatic NEPA analysis must include a ROD if no decision is being made. Eliminating the ROD would make clear to the public that this PEIS is primarily intended to facilitate early identification and analysis of important issues and impacts common to all NYB leases and not to narrow BOEM's or lessees' options at the COP stage or impose substantive requirements as with the presumptive application of the full suite of AMMM measures analyzed in the Draft PEIS.	Comment noted. A ROD could identify those AMMM measures BOEM may apply as conditions of approval for the COPs submitted for the NY Bight leases. This documentation does not constitute final agency action but may be integrated into the ROD for each individual project. Identification of the measures BOEM may apply does not narrow options at the COP stage because BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.
BOEM-2024-0001-0423-0001	A rational and timely permitting process is vital to meeting the goals of Executive Order 14008 ("Tackling the Climate Crisis at Home and Abroad" issued on January 27 2021) New Jersey's goal of 11 GW of offshore wind energy generation by 2040 (as outlined in New Jersey Executive Order No. 307 issued on September 21 2022) and New York's requirement of 9.0 GW of offshore wind energy generation by 2035 (as outlined in the Climate Leadership and Community Protection Act signed into law on July 18 2019).	Comment noted.

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	The permitting process for offshore wind is already extremely robust and Ocean Winds had expressed concern when the New York Bight PEIS process was announced as we feared that the PEIS had the potential to complicate and delay an already challenging process. Setting aside those concerns our Bluepoint Wind team has been working cooperatively with BOEM since it published its Notice of Intention (NOI) to prepare a PEIS on July 15 2022. The eighteen months between NOI and Draft PEIS is concerning and is impacting development of Construction and Operation Plans (COPs) for NY Bight lessees. It is disappointing that initial promises from BOEM that this PEIS will speed and not hinder project permitting and development do not seem to be materializing. That said Ocean Winds hopes that the Final PEIS will be issued on schedule and future PEIS efforts will proceed in a more expeditious manner. Further we note that this PEIS will set a precedent for the PEIS process in California and beyond. As such we urge BOEM to be thoughtful in its approach so that its actions in this process do not hinder development of an industry already facing a series of challenges on both coasts.	
BOEM-2024-0001-0423-0030	Purpose and Need for the Proposed Action Ocean Winds supports the [bold and italicized: intent] of the PEIS namely to reduce redundancies across COP-specific NEPA analyses and help BOEM make timely decisions on COPs for the six lease areas covered by the Draft PEIS. Rather than leading to a more efficient process for individual COP approvals the scale and scope of the proposed AMMMs represent a significant expansion beyond past precedent and ensures a longer process for reviewing individual COPs when developers inevitably consider alternatives to the AMMMs in their individual COP submittals. This in turn will lengthen and complicate what is already a challenging federal permitting process. The Draft PEIS continues a troubling trend of the federal government continuing to raise the bar for offshore wind when compared to other maritime industries many of which are known to cause meaningful negative impact to the sensitive resources that the AMMMs proposed in the Draft PEIS are intended to protect. Ocean Winds also notes that the six months-long delay in the release of the Draft PEIS has negatively impacted project timelines which hinder	The AMMM measures considered in the PEIS include measures that have been included in previous COP approvals, as well as those proposed through the scoping process. In response to numerous comments on the Draft PEIS AMMM measures, BOEM has reviewed all AMMM measures and has made several changes to the measures as presented in Final PEIS Appendix G. In summary, BOEM has split the AMMM measures into AMMM measures that BOEM has required as conditions of approval from previous activities proposed by lessees in COPs submitted and AMMM measures that have not been applied as terms and conditions of approval for previous activities proposed by lessees in COPs. In addition, BOEM has identified RPs that could be considered at the project-specific COP NEPA review. Refer to response to comment BOEM-2024-0001-0371-0004 regarding revisions to Alternative C. Further, this PEIS is *not imposing* any AMMM measures; it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures

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	the purpose and need of BOEM making timely decisions on COPs for the NY Bight leases and we urge BOEM not to allow further delays to the Final PEIS. As discussed above the delay associated with this PEIS along with the overreach in the substance of the document sets a concerning precedent for future PEIS processes.	are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient. Regarding PEIS timelines and delays, BOEM is working as efficiently as possible to ensure an adequate NEPA document is developed that meets all the statutory and regulatory requirements.
BOEM-2024-0001-0426-0002	History is full of bad government decisions that seemed like a good idea at the time. Take the Homestead Act for example where settlers were given free acreage in Kansas Oklahoma East Texas and elsewhere to farm. The governments' objectives were economic development continuation of a young country's "Manifest Destiny" westward and an increase in agricultural production. Most settlers farmed land or grazed cattle but soon unanticipated consequences began to appear. Farmers plowed over prairie grasses and planted dryland wheat. As the demand for wheat grew cattle grazing decreased and more acres were plowed and planted. When the world market for wheat became oversupplied prices dropped and farmers reacted to their loss of revenue by planting more wheat to make up on volume what they were losing on price. This dry land farming led to the systematic destruction of prairie grass. With the land gradually being stripped bare environmental damage began to occur. Finally with the drought of 1930 over farmed land blew away. The heartland of the U.S. became a vast dust bowl. An article by Jonathan Coppess from the University of Illinois Urbana-Champaign on the Dust Bowl offers haunting parallels for New Jersey clean energy policy:'' As one of the worst environmental disasters in our history the Dust Bowl was a confluence of policy human activities climatic shifts and the outer bounds of nature's tolerance. It should counsel humility about the ability of humans to perpetually push natural resources for their benefit The dust bowl was triggered by an extreme drought -part of a natural cycle over which we had little knowledge and Jess control - but it had been built by policies and misguided actions in an unfamiliar environment" Into the Unknown An often-quoted remark from Donald Rumsfeld former Secretary of Defense during a discussion linking Iraq with weapons of mass destruction states:" Reports that say that something hasn't	BOEM analyzes offshore wind projects using the best available science and information and seeks input from the public, agencies, and Tribal Nations to inform its decisions. For the PEIS, BOEM has identified information that was incomplete or unavailable for the evaluation of reasonably foreseeable impacts in Appendix E, *Analysis of Incomplete and Unavailable Information*.

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	happened are always interesting to me because as we know there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns- the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries it is the latter category that tends to be the difficult one." Known Unknows and Unknown. Unknows So are there any "known unknowns" and more troubling "unknown unknowns" lurking beneath the surface of efforts to accelerate offshore wind development?	
BOEM-2024-0001-0426-0008	Here at home PSE&G and Eversource have backed off from prior investment commitments to offshore wind. Do we understand why? There are other questions as well that have barely been explored at least publicly. Regarding national security an open field of hundreds of turbines in the middle of the Atlantic is an inviting soft target for terrorists or adversarial nations. How will we defend these resources?	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. Questions related to financial investments and national security are outside the scope of the PEIS. As stated in PEIS Section 2.3, non-routine activities and events, such as a terrorist attacks, are impossible to predict with certainty and are not analyzed in detail. In addition, PEIS Appendix E, *Analysis of Incomplete and Unavailable Information*, Section E.1.17, states that there is uncertainty regarding national security, but that the information that is available is appropriate for this programmatic level of analysis. Subsequent project-specific environmental analysis will be required for each individual COP.
BOEM-2024-0001-0439-0003	To address these concerns, the OSW industry urges BOEM to ensure that the final PEIS does not impose new analytical burdens or substantive requirements on lessees but instead serves as an analytical tool that improves the efficiency of the environmental review of COP-specific proposals within the NY Bight through tiering. To ensure this outcome: The Purpose and Need of the Proposed Action should be an analysis of AMMMs that BOEM *may* consider as conditions of approval.	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing any substantive obligations at this programmatic stage—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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BOEM-2024-0001-0439-0007	BOEM should not adopt AMMMs through NEPA. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions.[Footnote 5: 42 U.S.C. 4331.] Importantly NEPA is merely a procedural statute- it authorizes the use of substantive authorities for improved environmental outcomes but imposes no substantive requirements.[Footnote 6: NEPA only requires a "reasonably complete discussion of possible mitigation measures" to allow for a fair evaluation of avoidable and unavoidable environmental consequences.[Footnote 7: See id. At 352.] The Supreme Court has warned that there is no requirement under NEPA "that a complete mitigation plan be actually formulated and adopted."[Footnote 8: Id.] Indeed the Court has held that it would be "inconsistent" with NEPA's procedural focus "to demand the presence of a fully developed plan that will mitigate environmental harm."[Footnote 9: Id. At 353; see also Citizens Against Burlington Inc. v. Busey 938 F.2d 190 205-06 (D.C. Cir.) (agency not required to finish mitigation studies or execute mitigation plans before project begins) cert. denied 502 U.S. 994 (1991); Communities Inc. v. Busey 956 F.2d 619 625-26 (6th Cir.) (EIS lacking complete remediation plan adequate where sufficient investigation was conducted to identify mitigation alternatives and make reasonable estimate of cost) cert. denied 506 U.S. 953 (1992).] In short NEPA requires agencies to take a "hard look" at the environmental impacts of actions being proposed under substantive statutes over which they have authority such as OCSLA. NEPA itself does not provide authority to impose requirements or limit actions.[Footnote 10: Ibid. at 351.("other statutes may impose substantive environmental obligations on federal agencies but NEPA merely prohibits uninformed rather than unwise agency action.")]	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Instead, it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0439-0009	The Purpose and Need of the Proposed Action inappropriately shifts burden to developers. The Proposed Action proposes to "[adopt] measures *unless* future COP-specific NEPA analysis shows that implementation of measures is not warranted or effective"[Footnote 12: Draft PEIS ES-3.] Separate from the issue of adopting substantive measures discussed above the proposal to wait for site specific analysis to show that a measure is not warranted inappropriately shifts the burden to developers to prove that specific AMMMs	In an effort to create a more efficient process, the PEIS analyzes AMMM measures that have been applied previously through the COP-specific NEPA process. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not shifting the burden to developers—but is identifying those AMMM measures that BOEM may impose at

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	should not be imposed at the COP approval stage. This will significantly increase the costs to developers to study analyze and disprove the appropriateness of certain measures. This is a burden found in neither NEPA nor BOEM regulations nor other reviewing statutes. The final PEIS should not require site-specific analysis to disprove the need for prematurely adopted AMMMs. Rather the PEIS should help inform the site-specific NEPA review but ultimately the analysis in the site-specific NEPA document should determine which AMMMs are reasonable and necessary for the project under review.	the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient. In addition, see response to comment BOEM-2024-0001-0423-0030 regarding BOEM's review and revisions of AMMM measures in the PEIS and identification of RPs.
BOEM-2024-0001-0439-0010	The Purpose and Need of the Proposed Action The Adoption of AMMMs is contrary to BOEM's authority under OCSLA and NEPA. BOEM states that the Proposed Action for the Draft PEIS is "the adoption of programmatic AMMM measures that BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of measures is not warranted or effective."[Footnote 13: Draft PEIS ES-3.] Stating that BOEM "would require" the AMMMs as conditions of approval is contrary to BOEM's authority under OCSLA's implementing regulations. First under BOEM's implementing regulations the agency cannot use a PEIS to "pre-approve" COP terms and conditions. Doing so prematurely imposes a substantive burden on lessees and inappropriately preempts the COP approval process. BOEM regulations outlining the COP approval process state that BOEM conducts an environmental review once the lessee has submitted a COP and that "upon completion of our technical and environmental reviews and other reviews required by Federal Law BOEM may approve disapprove or approve with modifications your COP. If we approve your COP we will specify terms and conditions to be incorporated into your COP."[Footnote 14: 30 C.F.R. 585.628(f).] Importantly BOEM approves a COP including mitigation measures upon completion of the environmental review. In short as required by regulation a lessee submits a COP which includes proposed measures to reduce impacts from the proposed activities within the COP to BOEM. BOEM subsequently reviews the COP for completeness and sufficiency and conducts an environmental review on the COP. It is at this stage that BOEM determines which AMMMs	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not prematurely adopting AMMM measures through the PEIS—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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	should be included in the environmental review for analysis and which AMMMs should be selected for adoption as terms and conditions of plan approval. In contradiction to these regulations BOEM is proposing to rely on this PEIS to prematurely adopt AMMMs prior to COP review and approval. While BOEM can certainly rely on a PEIS to analyze the impacts of appropriate AMMMs (as discussed in more detail below) it should not use the PEIS as authority to impose a substantive burden on a lessee prior to the COP review and approval.[Footnote 15: As noted in the section below it is no defense that a lessee may theoretically rebut the adoption of an AMMM at the COP stage by demonstrating that it is not "warranted or effective." This new burden is not found in BOEM's regulations.]	
BOEM-2024-0001-0439-0011	Premature adoption of AMMMs may also inadvertently overlook consultation processes such as under the Endangered Species Act (ESA) which begins with review of a fully developed site- specific action in sufficient detail to assess the effects of the action on listed species and critical habitat.[Footnote 16: 50 C.F.R. 402.14(c)(1)(i) (requiring detailed description of proposed action to initiate ESA consultation).] If the activity is allowed by an incidental take statement any reasonable and prudent measures imposed as a result of the ESA process "cannot alter the basic design location scope duration or timing of the action and may involve only minor changes."[Footnote 17: Id. 402.14(i)(2).] Similarly the Marine Mammal Protection Act ("MMPA") authorization process begins with a developer's application to conduct site-specific activities and any conditions imposed must be "practicable" and may not unduly interfere with the activity's implementation.[Footnote 18: 16 U.S.C. 1371(a)(5)(A)(i)(II)(aa) ("practicable" requirement for conditions in incidental take regulations provision); id. 1371(a)(5)(D)(ii)(I) ("practicable" requirement for conditions in incidental harassment authorizations); see Nat. Res. Def. Council Inc. v. Pritzker 828 F.3d 1125 1134-35 (9th Cir. 2016) (interpreting "least practicable adverse impact" requirement under 16 U.S.C. 1371(a)(5)(A)(i)(II)(aa)); id. At 1135 n.9. (eliminating 99% of oceans from sonar activity would be more protective of marine mammals "[b]ut it would not be practicable because it would so restrict military options for readiness	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not prematurely adopting AMMM measures through the PEIS—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient. Identification of AMMM measures through the PEIS process would supplement and inform but not supplant the identification of measures at the project-level ESA consultation. Based on comments provided on the Draft PEIS, BOEM revised AMMM measures as presented in Appendix G. Some of these measures would mitigate impacts on ESA-listed species. During project-level ESA consultation, agencies may identify additional measures to minimize effects on federally listed species.

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	training that it would render such training ineffective").] Other environmental review statutes including the Clean Air Act and the Clean Water Act contain similar requirements to review site- specific plans and limit agencies' conditioning authority over proposed activities.[Footnote 19: 40 C.F.R. 1502.24 (To the fullest extent possible agencies shall prepare draft environmental impact statements concurrent and integrated with environmental impact analyses and related surveys and studies required by all other Federal environmental review laws and Executive orders applicable to the proposed action including the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) the National Historic Preservation Act of 1966 (54 U.S.C. 300101 et seq.) and the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).] As such any AMMMs that would potentially be required under the ESA MMPA or other environmental statutes should not be adopted prior to the completion of the consultation process. In the final PEIS, BOEM should clarify that the Proposed Action is an analysis of AMMMs that BOEM may consider as conditions of approval. As such future site-specific analysis would determine whether an AMMM considered in the draft PEIS is warranted rather than determining whether such measure is [italicized: not warranted.] Under this scenario BOEM would still rely on the PEIS to provide an environmental analysis of impacts and to tier site-specific reviews but it would not prematurely require the adoption of specific AMMMs. The final PEIS would include an analysis of all reasonable AMMMs that BOEM may require as terms and conditions of COP approval. BOEM would not be required to re-analyze each AMMM included in the final PEIS when reviewing and approving a COP. As such the final PEIS would allow for consistency standardization and a more efficient environmental review process at the site-specific level.	
BOEM-2024-0001-0452-0001	Purpose of a PEIS We applaud BOEM for initiating this Programmatic Environmental Impact Statement (PEIS) specific to mitigation measures for regional OSW projects. This action appears partially responsive to longstanding fishing industry requests to better assess the cumulative impacts of the numerous OSW projects in the permitting pipeline and to conduct dedicated analyses regarding fisheries-	Section 1.2, Table 1-1, *History of BOEM planning and leasing activities in the NY Bight*, summarizes the history of BOEM's planning process and lease sale for the NY Bight, including the 2018 Call for Information and Nominations, the 2021 identification of the WEAs, and the Draft and Final Environmental Assessment (EA) for commercial and research leases. The table also summarizes the public notification and public comment

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	specific mitigation measures that should be included as Terms and Conditions of any OSW project approval. [Footnote 10: As described in later sections of these comments a PEIS can only meet BOEM's obligations to avoid minimize and mitigate impacts to the environment if conducted in advance of lease issuance and if it includes all activities related to the proposed action in this case the multiple phases of OSW development. Instead the timing of this PEIS after leases have been issued results in the most meaningful opportunities to avoid impacts identified through environmental review to have already been lost.] The federal OSW leasing program needs substantially more attention devoted toward developing and incorporating fisheries and ecosystem data not less and this PEIS should not result in reduced scrutiny in the downstream approval of any OSW project. Rather we reiterate previous well known requests to BOEM to develop measurable criteria for excluding areas from development when risks to the physical and human environment exceed acceptable thresholds and apply those on regional and project-specific bases in all regions. Disappointingly the draft PEIS only evaluates the six OSW leases in the NY Bight excluding the existing leases on the east coast and anticipated addition of Central Atlantic WEAs all which contribute to cumulative effects to many of the same species oceanographic systems and fisheries. The draft PEIS also does not explain how BOEM's ongoing development of fisheries mitigation guidelines will interface with the findings of the final PEIS.	periods that were conducted as part of the process. The analysis and development of the WEA in the NY Bight are summarized in the *New York Bight Area Identification Memorandum Pursuant to 30 CFR 585.211(b),* which is found on BOEM's website: https://www.boem.gov/sites/default/files/documents/renewable-energy/Memorandum%20for%20Area%20ID%20in%20the%20NY%20Bight.pdf. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under BOEM's regulations, and that analysis will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. BOEM assesses the cumulative effects of the NY Bight projects in combination with ongoing and planned reasonably foreseeable activities, which are defined in Section 3.3.1. In addition, BOEM would have the opportunity to consider new information in each individual COP-specific NEPA document about what other activities are reasonably foreseeable at the time. Table 3.6.1-21 provides an RP, COMFIS-5, which recommends that lessees follow the Fisheries Survey Guidelines issued by BOEM with regards to pre-, during- and post-construction fisheries monitoring survey plan design.
BOEM-2024-0001-0469-0002	Purpose of and Need for the Proposed Action The Draft PEIS states that the purpose of the proposed action is to: "identify issues analyze degree of potential impacts and adopt as appropriate AMMM measures This PEIS will reduce redundancies across COP-specific NEPA analyses including very similar affected environments impacts and mitigation measures and will allow for future project-specific NEPA documents to be focused on the project-specific impacts not considered in the PEIS or those impacts that warrant further consideration. The Proposed Action is needed to help BOEM make timely decisions on COPs submitted for the six	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected

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	NY Bight lease areas." [Footnote 5: BUREAU OF OCEAN ENERGY MGMT. NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT at 1-4 1-5 (Jan. 2024).] The agency's main goal in taking this approach clearly appears to be expediting review and approvals of future OSW projects. This is concerning as there are many knowledge gaps regarding the marine life in this region and the potential effect of creating a vast array of OSW installations. [Footnote 6: E.g. BUREAU OF OCEAN ENERGY MGMT. NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT appx. E (Jan. 2024); BUREAU OCEAN ENERGY MGMT. & NAT'L OCEANIC & ATMOSPHERIC ADMIN. BOEM & NOAA FISHERIES NORTH ATLANTIC RIGHT WHALE AND OFFSHORE WIND STRATEGY at 9 (Jan. 2024) (citing Dorrell RM Lloyd CJ Lincoln BJ Rippeth TP Taylor JR Caulfield CP Sharples J Polton JA Scannell BD Greaves DM et al. 2022. Anthropogenic mixing in seasonally stratified shelf seas by offshore wind farm infrastructure. Frontiers in Marine Science. 9:830927. Doi:10.3389/fmars.2022.830927 and Raghukumar K Nelson T Jacox M Chartrand C Fiechter J Chang G Cheung L Roberts J. 2023. Projected cross-shore changes in upwelling induced by offshore wind farm development along the California coast. Communications Earth & Environment. 4(4):116. Doi:10.1038/s43247-023-00780-y).]Sound science takes time; as does planning to determine and assess the impacts and take actions to avoid minimize and/or mitigate accordingly. Doing less puts marine life at grave risk.	environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. During the COP-specific NEPA process, BOEM will hold a public comment period at the start of the NEPA process (scoping) and following the release of the Draft NEPA document, whereby members of the public and agencies can provide input to help inform the NEPA process, alternatives, and mitigation measures to identify and minimize environmental effects. Additionally, throughout the NEPA process BOEM works closely with Cooperating Tribal Governments and federal and state agencies to assist with assessing impacts and identifying mitigation measures.
BOEM-2024-0001-0469-0003	The Draft PEIS assumes the maximum use scenario that projects will use the most impactful range of the project design envelope. However for some factors BOEM predicts that impacts will be "negligible to major "the entire possible range of impacts because the actual impacts will depend on the individual parameters of the project. [Footnote 7: NEW YORK BIGHT DRAFT ENVIRONMENTAL IMPACT STATEMENT supra note 5 at ES-10-13] In addition the Tiering Guidance appendix states that the impact analysis in the PEIS for categories such as marine mammals cannot be used for individual Construction and Operations Plan ("COP") environmental reviews under the National Environmental Policy Act ("NEPA"). [Footnote 8: Id. At appx. C.] Taken together this all calls into question the utility of	The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. Project-specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater, equal, fewer, or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Refer to Appendix C, *Tiering Guidance*, for specific recommendations by resource topic regarding how the PEIS may be incorporated by reference in the future COP-specific NEPA

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	attempting to analyze such project-dependent impacts on a programmatic scale.	documents; this appendix also identifies additional analysis that would likely be required as part of the COP-specific NEPA analysis once detailed and site-specific project information is available.
BOEM-2024-0001-0469-0004	In absence of a PEIS avoidance minimization and mitigation ("AMMM") measures would be analyzed in the NEPA reviews of individual projects on a case-by-case basis. BOEM proposes choosing Alternative C adopting mitigation measures on a programmatic level i.e. for all six projects. [Footnote 9: Id. At ES-3]. According to BOEM representatives this would allow the agency to simply "check a box" applying the mitigation measure once they determined the measure applied to the individual project instead of performing an individual analysis on the mitigation measure. However for many affected resources the projected impacts remain constant between Alternative B (deferring adoption of mitigation measures until the individual NEPA review) and Alternative C especially for cumulative impacts. BOEM representatives stated that they would refine the mitigation measures as OSW develops and expressed that they were especially interested in comments on the mitigation measures themselves which COA provides later in Section VI. While COA does not wish to discourage the development and adaptation of AMMM measures it is unacceptable that currently available AMMM measures do not appear to be effective based on these projections.	Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. Project-specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater, equal, fewer, or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Based on public and agency comments on the Draft PEIS, BOEM has revised several AMMM measures, which are described in Appendix G, *Mitigation and Monitoring*.
BOEM-2024-0001-0469-0005	Additionally the Draft PEIS references New York and New Jersey's statutory mandate and executive orders (respectively) requiring a certain amount of wind energy generation by a target year as well as the federal government's Executive Order 14008 and the associated goal to generate thirty (30) gigawatts of OSW capacity by 2030. The federal goal was developed by the Departments of Interior, Energy, Commerce, and Transportation but there is no detailed documentation or analysis on how these goals were developed and what environmental technological or economic standards they meet nor any public transparency or review. All these goals are intended to boost renewable energy development but the goals do not go through the same environmental review processes as the individual projects created to meet them.	Section 1.3, *Purpose of and Need for the Proposed Action*, describes the purpose of the Proposed Action, which supports Executive Order 14008 “Tackling the Climate Crisis at Home and Abroad” and President Biden administration’s goal of 30 GW of offshore wind capacity by 2030. Goals set by the federal government or the states are not federal actions that require NEPA review.

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BOEM-2024-0001-0469-0006	In summary the purpose and need statement prioritizes speed over due process and filling scientific knowledge gaps. The programmatic approach is of limited help when so many impacts must be considered at the individual COP review stage and the AMMM measures do not appear to change the overall environmental impacts in many cases. Further the push for OSW development is based on aspirational goals.	Project-specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater, equal, fewer, or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Refer to Appendix C, *Tiering Guidance*, for specific recommendations by resource topic regarding how the PEIS may be incorporated by reference in the future COP-specific NEPA documents; this appendix also identifies additional analysis that would likely be required as part of the COP-specific NEPA analysis once detailed and site-specific project information is available.
BOEM-2024-0001-0470-0004	The amounts of installed capacity and number of Wind Turbine Generators (WTGs) in the planned projects as described in the PEIS are inconsistent and seriously misleading:--On page ES-4 the PEIS states “Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy."--On the same page the PEIS states an estimated 16-18 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022).--On page ES-7 of the PEIS BOEM states that "For the analysis of six NY Bight projects BOEM anticipates development of 1103 WTGs 22 offshore substations (OSSs) 44 offshore export cables totaling 1772 miles (2852 kilometers) and 1582 miles (2546 kilometers) of inter-array cables across the six NY Bight lease areas."---This assertion that the six NY Bight projects would build "up to 1103 WTGS" is repeated on PEIS page 2-16.--On page 3.4.1-8 the PEIS says the NY Bight Projects evaluated in the PEIS would construct an estimated 9922 MW of renewable power from the installation of 713 WTGs citing Table D2-1 in Appendix D.---Table D2-1 indicates only 8822 MW will be installed by the current projects and require 615 WTGs---Table D2-1 further indicates that a further 1103 WTGs are planned but fails to disclose the resulting installed MWs. (Using a ratio analysis of the data provided in Table D2-1 if 615 WTGs will produce 8822 MW of installed capacity then 1103 WTGs would constitute another 15822 MW installed).--The Table in Appendix D appears to conflict with text	The estimated power ratio of 3 MW per square kilometer and an estimate of 5.6 to 7 GW for total generating capacity of the NY Bight leases presented in Section 1.3 of the PEIS are derived from the BOEM December 2021 Final Sale Notice for the NY Bight leases. BOEM has added a footnote to this statement in Section 1.3 clarifying the source of this information. The power-generating capacity from the Final Sale Notice is provided for informational purposes and is not used in the analysis of the alternatives. The analysis of the alternatives is based on the parameters of the RPDE described in Section 2.1.2 of Chapter 2. BOEM recognizes that as technology advances and as projects are designed to maximize power output, the actual generation capacity of the NY Bight lease areas could be greater. Refined estimates of the anticipated generation capacity of each project proposed in the NY Bight lease areas will be described in each COP and project-level NEPA analysis. The purpose and need states the PEIS supports state climate goals, but it is not intended to meet state obligations. BOEM’s leasing process for offshore wind is independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals. The estimate of 9,922 MW of renewable power in Section 3.4.1.1 (now 9,561 MW due to updates to ongoing and planned offshore wind projects in PEIS Appendix D) is describing ongoing and planned offshore wind in the geographic analysis area for air

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	elsewhere in the PEIS and indicates the total planned buildout of OSW in the NY Bight leases is 26644 MW.	quality, excluding the NY Bight project. In Table D2-1, the combined number of turbines for all six NY Bight projects (1,103 WTGs) is presented, consistent with the estimates presented in the six-project RPDE in Chapter 2. To avoid speculation, the total generating capacity of the NY Bight leases is not described. The generating capacity of a turbine or a project does not directly relate to impacts; it is rather the physical dimensions of the WTGs and other parameters that relate to environmental impacts.
BOEM-2024-0001-0470-0005	[Bold: II. COMMENTS][Underline: 1. Segmentation:] [Bold: The PEIS violates 38 CFR Section 200.4 by improperly segmenting the Proposed Action from the full complement of OSW projects and installed Wind Turbine Generators (WTGs) needed to meet the dual legal requirements of service load obligations and applicable state mandates for renewable energy.] The purpose of the Proposed Actions is to build and operate OSW facilities that produce "renewable" electricity from sources approved under NY law and NJ Executive Order to meet what is now and re- mains in the future a long-established "service obligation" [Footnote 1: Federal law defines the "service obligation" as a requirement applicable to or the exercise of authority granted to an electric utility under Federal State or local law or under long-term contracts to provide electric service to end-users or to a distribution utility (16 USC Section 824q).] to provide electricity to end-use consumers. Switching the existing generation from fossil fuels and nuclear power to renewables such as offshore wind requires full assessment of the impacts of building out the full complement of OSW facilities that will be needed so a) the public is fully informed of the magnitude of the federal action and b) complete and cumulative impacts can be assessed. This "segmenting" of OSW projects is a blatant violation of NEPA and its regulations given the stated purpose of the PEIS is to assess the "potential biological socioeconomic physical and cultural impacts that could result from development activities for six commercial wind energy leases in an area offshore New Jersey and New York known as the New York Bight (NY Bight)" (PEIS page ES-3).	The regulations identified in the comment (38 CFR 200.4) do not apply to BOEM or the DOI. The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. BOEM assesses the cumulative effects of each project in combination with ongoing and planned reasonably foreseeable activities, which are defined in Section 3.3.1. The cumulative effects analysis in the PEIS considers ongoing and planned offshore wind activities. This analysis will be reviewed and augmented at the COP specific stage to ensure that each project is considered in the context of reasonably foreseeable activities. In the PEIS, BOEM considers the effects of the addition of the six NY Bight projects to other ongoing and planned projects in accordance with NEPA.
BOEM-2024-0001-0470-0010	[Italics: c) The forecast growth in electricity demand by industry regulators cannot be met by the segmented OSW Projects described in the PEIS]The planned 8822/9922 MW construction under the	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and

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	Proposed Action is well below the 20 MW total needed for the initial compliance with NYS CLCPA and the NJ EO and woefully below what NYISO growth forecasts indicate will be needed for full NYS compliance alone. The PEIS borders on fraudulent in its failure to fully disclose and assess the full effects of building out and operating the total number of WTGs needed to "meet" renewable goals and mandates given the realities of demand growth and service obligation; the full buildout will generate compounding and cumulative damage to irreplaceable maritime assets from construction and operation of both WTGs and attendant transmission facilities that are effectively ignored. Nor does the PEIS disclose and analyze the amount of non-intermittent electric generation (nuclear hydro fossil etc) along with storage/battery facilities that will be needed to ensure reliable electric supplies during the 60% downtime experienced by OSW generation or storage facilities.	analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. The purpose and need further states that the PEIS supports federal goals of 30 GW and state goals, but it is not intended to meet state obligations. BOEM's leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals. The PEIS does disclose the cumulative effects of buildout of other ongoing and planned offshore wind projects on the OCS within the geographic area of analysis for each resource. Regarding other sources of energy, the PEIS is analyzing wind development in six offshore wind lease areas, and the analysis of other sources of energy or battery storage is outside the scope of this PEIS.
BOEM-2024-0001-0470-0011	-[Italics: New York]Page 3.4.1-6 of the PEIS notes that the New York State Energy Research and Development Agency (NY- SERDA) led the development of the New York State Offshore Wind Master Plan is leading the coordination of offshore wind opportunities in New York State and is supporting the development of 9000 MW of offshore wind energy by 2035.[Table 4: NYSERDA Projected Generation and Fuel Type]NYSERDA Generation Model: Upstate 2030; Demand Load (Gigawatt Hours/ GWh): 51223; Percentage Renewable: 70%; Percentage Offshore Wind: 0%NYSERDA Generation Model: Downstate 2030; Demand Load (Gigawatt Hours/ GWh): 100455; Percentage Renewable: 70%; Percentage Offshore Wind: 24%NYSERDA Generation Model: Upstate 2040; Demand Load (Gigawatt Hours/ GWh): 74905; Percentage Renewable: 75%; Percentage Offshore Wind: 0%NYSERDA Generation Model: Downstate 2040; Demand Load (Gigawatt Hours/ GWh): 132601; Percentage Renewable: 90%; Percentage Offshore Wind: 33%[Table End][Bold: Source: NYSERDA.NY.Gov]On its [Underline: "Story of Our Grid"] page NYSERDA divides the NYCA into Up- and Downstate regions to illustrate how various fuel types will be used to deliver the NYISO-measured load demand. NYSERDA calculations of future demand levels (using numbers similar but not equal to those of the	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. The purpose and need further states that the PEIS supports federal goals of 30 GW and state goals, but it is not intended to meet state obligations. BOEM's leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals. Additionally, BOEM can only act as authorized under OCSLA, and it has no control over how much energy/electricity is needed or what other types of energy sources are used. Each individual COP submitted by a developer to BOEM will be analyzed separately as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates

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	NYISO) and planned renewable contributions for the NYS Grid are summarized in Table 4. [Footnote 3: The total demand included in the NYSERDA calculations for 2030 are lower and the 2040 estimates are higher than the forecasts in the NYISO Gold Book provided in Table 2. NYSERDA does not provide estimates to 2053] [Footnote 4: New York City demand is currently about 55000 GWh a little over half of the forecast 2030 Downstate demand for ~100000 GWh.] NYSERDA's Upstate/Downstate demand ratios run about one-third/two-thirds of the total load demand in the NYCA. Applying those ratios to the 2053 NYISO forecast downstate demand will approximate 155113 GWh. The "Story of Our Grid" webpage states that "Downstate load is completely met with zero emissions generation in 2040" a claim that is based on 33% of load being met with offshore wind. Applying this 33% requirement to the 2053 demand forecast means that more than [Bold: 50000 GWh] of OSW generation is necessary meet the CPCLA mandates in 2053. [Footnote 5: Calculations of GWh from OSW WTGs herein use a capacity factor of 40% a three-year average of global capacity factors for 2020 to 2022 reported in 2024 by Statista.] Sourcing the 2040 downstate demand with 33% OSW production (as planned by NYSERDA) would require WTG capacity to make [Bold: 43758 GWh.] As noted above were the projects to actually total 9922 MW from 713 WTGs (vice 8822 MW from 613 WTGs) electric generation could approach [Bold: 35000 GWh of electricity.] Assuming NY gets 50% of the output from the set (segment) of projects analyzed in the PEIS [Bold: the 2053 demand shortfall would be more than 30000 GWh.] Looked at another way meeting the 2053 downstate demand of over 155000 GWh with 33% OSW [Bold: (50000 GWh)] requires about [Bold: 15000 MW of installed OSW capacity.] This means NYS alone requires nearly half of all the off-shore wind in the Administration’s Program to actually meet its CPCLA obligations. The PEIS completely fails to disclose the reasonably foreseeable future actions needed to secure the actual MW/WTG buildout needed to produce the 50000 GWh to meet the NYS mandate alone.[Table Start: Eastern Seaboard Homes]Eastern Seaboard States: ME; "HOMES" (in millions): 0.57Eastern Seaboard States: MA; "HOMES" (in millions): 2.71Eastern Seaboard States: RI; "HOMES" (in millions): 0.42Eastern	may be included in the COP-specific NEPA analysis for each lease area. BOEM assesses the cumulative effects of each project in combination with ongoing and planned reasonably foreseeable activities, which are defined in Section 3.3.1. The cumulative effects analysis in the PEIS considers ongoing and planned offshore wind activities. This analysis will be reviewed and augmented at the COP-specific stage to ensure that each project is considered in the context of reasonably foreseeable activities. In the PEIS, BOEM considers the effects of the addition of the six NY Bight projects to other ongoing and planned projects in accordance with NEPA.

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	Seaboard States: CT; "HOMES" (in millions): 1.39Eastern Seaboard States: NY; "HOMES" (in millions): 7.53Eastern Seaboard States: NJ; "HOMES" (in millions): 3.39Eastern Seaboard States: PA; "HOMES" (in millions): 5.14Eastern Seaboard States: DE; "HOMES" (in millions): 0.45Eastern Seaboard States: MD; "HOMES" (in millions): 2.29Eastern Seaboard States: VA; "HOMES" (in millions): 3.24Eastern Seaboard States: NC; "HOMES" (in millions): 4.01Eastern Seaboard States: SC; "HOMES" (in millions): 1.97Eastern Seaboard States: GA; "HOMES" (in millions): 3.88Eastern Seaboard States: FL; "HOMES" (in millions): 8.15Eastern Seaboard States: Total; "HOMES" (in millions): 45.14[Table End][Bold: Source: US Census Bureau] For purposes of grid stability and reliability as well as delivering forecast demand requirements it is important to note that the Downstate/NYC demand for 50000 GWh includes vast municipal enterprise systems such as subways wastewater treatment plants hospitals emergency services (police fire emergency medical) street and traffic lights all requiring 24/7 electricity supply in copious amounts for all residents but especially underserved and environ- mental justice populations. Describing actual turbine electricity production in euphemistic misleading comparisons about powering "X Million Homes" is highly deceptive. As Table 5 shows the Eastern Seaboard has over 45 million "homes." Breaking down the deceptive tagline about the vaunted Atlantic OSW program powering "10 Million Homes" if the planned 30 GW installed can serve 10 million homes 45 million homes will require 135 GW installed. The US Department of Energy typically cites 412 offshore WTGs as the requirement per gigawatt meaning that powering [Bold: all] the East coast homes (and [Bold: just] the homes) with the needed 135 gigawatts of wind at 412 turbines per gigawatt puts over 55000 turbines in the irreplaceable maritime system of the Atlantic a far cry for the 600-700 turbine segment analyzed in the PEIS.	
BOEM-2024-0001-0470-0012	[Italics: New Jersey]Data on load growth in New Jersey is not as clear due to its inclusion in the multi-state Pennsylvania/Jersey/Maryland ISO (PJM). The [Underline: 2024 PJM Load Forecast Report] states that the total annual energy use throughout the PJM footprint is expected to increase nearly 40% by 2039 from the current 813328 to 1021955 GWh. Of that about 30000 GWh of additional demand is	Please see response to comment BOEM-2024-0001-0470-0011.

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	identified as coming from the four NJ utility zones summarized in Table 6. [Footnote 6: The total NJ load growth was calculated by subtracting the 2024 load forecast amount from the 2039 load forecast amount for the four NJ service zones listed in Table E-1 ANNUAL NET ENERGY (GWh) AND GROWTH RATES FOR EACH PJM MID- ATLANTIC ZONE AND GEOGRAPHIC REGION 2024 – 2034 summarized on pages 71-72 of the 2024 PJM Load Forecast Report linked above.][Table 6: NJ Forecast Load Increases]NJ Utility Zone: Atlantic Electric (AE); Load increase 2024-2039 (GWh): 2556NJ Utility Zone: Jersey Central Power & Light (JCPL); Load increase 2024-2039 (GWh): 11380NJ Utility Zone: Public Service Electric & Gas (PS); Load increase 2024-2039 (GWh): 15155NJ Utility Zone: Rockland Electric (East) (RECO); Load increase 2024-2039 (GWh): 341NJ Utility Zone: Total; Load increase 2024-2039 (GWh): 29432[Table End][Source: 2024 PJM Load Forecast Report]According to the [underline: U.S. Department of Energy's Energy Information Agency (EIA)] New Jersey plants of all types produced 65061 GWh of electricity in 2022 of which 33394 GWh came from natural gas production. [Footnote 7: US EIA New Jersey Electricity Profile 2022. New Jersey currently has 26 natural gas-fired power plants.] The entire mandated 11000 MW of OSW installed capacity (only a fraction of which will come from the Proposed Action being evaluated) could only produce about 39000 GWh. This means that full buildout of the NJ EO goal (one-third of the total Atlantic OSW planned by the Biden Administration) might produce enough electricity to replace natural gas plants or increase production to meet load growth from data centers and electric vehicles [Bold: but not both.] It is hard to conceive how the purpose of the action to make the New Jersey grid emission-free is satisfied if only the disclosed segment of OSW wind construction is used. These arithmetic impossibilities become even more glaring and problematic when considering the 2023 acceleration of clean energy goals in [Underline: NJ Executive Order 315]. Previously the 2019 EMP required 100 percent clean energy by 2050; the new EO 315 deadline is 2035. Notably the NJ State Senate recently woke suddenly from a green-dream when a bill authorizing a public referendum on amending the state’s Constitution to ban construction of new power plants that burn natural gas or other	

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	fossil fuels was amended to allow the construction of such plants if they are to be primarily used as emergency backup power sources. The carve-out manages the damaging grid reliability risks exposed when Superstorm Sandy knocked out power in 2012 causing nearly a billion gallons of untreated sewage to flow into area waterways because sewage plants lacked accessible backup generation. The New Jersey arithmetic again demonstrates that the realities of the service obligation and actual OSW electricity production confirm these projects are but a fractional segmented portion of the actions needed to meet the overall energy production goals not just renewable standards.	
BOEM-2024-0001-0470-0013	[Italics: c) The final EIS analysis must analyze the fully aggregated (not segmented) complement of operational generation assets and storage capacity needed to reliably satisfy the identified electricity demand (including growth) while combatting the climate crisis through deployment of clean energy technologies and infrastructure.]The PEIS must redefine the Proposed Action as including construction and operation of the full complement of WTGs and storage facilities needed to meet both the known load requirements and renewable portfolio standards simultaneously. Without properly defined and unsegmented actions any evaluation or adoption of so-called programmatic avoidance minimization mitigation and monitoring (AMMM) measures remains inaccurate insufficient misleading and violative of the spirit and letter of the National Environmental Policy Act and its attendant regulations.	Please see response to comment BOEM-2024-0001-0470-0011.
BOEM-2024-0001-0470-0020 and BOEM-2024-0001-0470-0021	[Bold: III. SUMMARY]-In spite of high populations and significant population density East Coast states almost universally achieve the lowest per capita carbon emissions in the country based on their historic underwriting of clean energy and transport systems. --Inland states with whom eastern states are competing for new manufacturing facilities and other economic development opportunities still make significant portions of their electricity from coal and natural gas. This keeps electricity prices low and attracts businesses that use electricity as operational fuel at the same time greenhouse gas emission levels remain high. --Forcing eastern states to shut down clean capacity and/or prematurely retire non-coal electricity production facilities in favor	Please see response to comment BOEM-2024-0001-0470-0011. BOEM has authority under OCSLA to authorize renewable energy activities on the OCS and evaluates projects as proposed by developers under its regulations. Electricity rates are not within the scope of the PEIS and are part of agreements with the state and developer.

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	of massive expenditures for OSW facilities that are merely presumed to be “environmentally preferable” (all evidence to the contrary) further increases already high east coast electricity prices and exacerbates [Underline: competitive advantage already accruing to fossil-electric generating states.]	
BOEM-2024-0001-0470-0022 and BOEM-2024-0001-0470-0023	For an industry as damaging dangerous and risky as OSW whether by design or function BOEM's system of programmatic EISs coupled with tiered analysis for subsequent issuance of various construction permits and approvals woefully fails to meet the most basic principles and requirements of the National Environmental Policy Act and this PEIS is no different. --Analyses separated into geographically disperse lease-areas inevitably suffer from improper segmentation fail to assess cumulative impacts and ignore the macro-socioeconomic impacts that will affect businesses and populations across large areas because these projects involve electricity as fundamental to survival in today’s times as air and water.	Please see response to comment BOEM-2024-0001-0470-0011. The PEIS is a regional analysis and not an analysis on specific individual lease areas.
BOEM-2024-0001-0470-0024	BOEM cannot willfully ignore the realities and plain arithmetic of electricity demand growth when assessing the viability and effects of eliminating electric generation plants that can meet critical survival needs sanitation transportation communication safety education food security inter alia in favor of expensive unreliable and damaging WTGs that cannot do the job without multiple layers of storage backup along with additive transmission facilities. These sine qua non co-components bring compounding as well as cumulative negative effects to the areas where they must be built and operated. --By 2053 downstate New York electricity demand growth is forecast to be over 155000 GWh (two-thirds of 253020 GWh); producing 33% of that load with OSW (50000 GWh) requires the output of about 15000 MW of installed OSW capacity far more than the current acknowledged projects could deliver to the NY Grid. --By 2039 New Jersey is forecast to add 29432 GWh to its demand load and also plans to replace 33394 GWh of current electricity produced by natural gas plants both with OSW. Satisfying this actual requirement for 62826 GWh of clean/renewable electricity for NJ’s portion of the PJM grid with OSW would necessitate more than the planned 11 GW installed capacity.	Please see response to comment BOEM-2024-0001-0470-0011. Offshore wind would likely be in addition to other energy sources. Wind energy would displace fossil fuel energy to the extent that it is offered to the grid at a lower price than the bids from fossil-fueled energy sources.

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	--Electricity demand in these two states alone have an estimated requirement for about 26 GW of installed OSW to meet service obligations almost 87% of the entire 30 GW Atlantic Offshore Wind Program planned by the Biden Administration. --To the extent the current Proposed Actions build less than 26000 GW installed OSW capacity in the NY Bight to meet concurrent demand growth and portfolio standards additional undisclosed energy storage facilities will also be required to reliably assure service obligation generation levels. The size location and full suite of impacts from the construction and operation of such storage facilities along with all necessary transmission and distribution infrastructure must be included in any and all environmental impact analysis to prevent improper segmentation and assure full cumulative impact analysis.	
BOEM-2024-0001-0470-0025	No amount of mitigation can be accurately assessed or planned in the absence of accurate and fully disclosed impacts and effects from building and operating the full complement of OSW WTGs and attendant storage/transmission facilities needed to meet the knowable and known amounts of electricity required to sustain the populations and assets of the affected states. The environmentally preferable option for greening the nation's electricity portfolio does not involve the green eastern seaboard states. Real decarbonization will come from discontinuing the 675000 GWh of electricity still produced with coal plants in the US few if any of which are in Atlantic Seaboard states. --No agency of federal state or local government should use public funds to subsidize or under- write premature retirement and/or displacement of existing non-coal electricity production assets until existing coal plants are first replaced by the ratepayers who benefit from them (especially those in states with the highest GHG outputs per capita).	Please see response to comment BOEM-2024-0001-0470-0011.
BOEM-2024-0001-0474-0004	Among other reasons the action is Arbitrary because the BOEM administrative process favors the private interests of offshore wind developers to the detriment of the citizen stakeholders and the general public. Among other reasons the action is Arbitrary because the energy goals established in Executive Orders and Presidential Proclamations are not within the authority of the Executive Branch	Please see response to comment BOEM-2024-0001-0470-0011. BOEM's responsibility under the Energy Policy Act of 2005 is to issue renewable energy leases, easements, and ROWs for activities on the OCS (see PEIS Section 1.4, *Regulatory Overview*).

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	and do not have the force of law as the authority belongs in the legislative branch of government. Among other reasons the action is Arbitrary because the energy goals established by Executive Orders and presidential proclamations usurp personal freedoms. Among other reasons the action is Arbitrary because fees paid by the leaseholders and other funds collected from leaseholders and offshore wind developers are illegally and improperly deposited to the United States Treasury without dedication to the specific purpose and recognition of the cost of harm and remediation to the ocean. Among other reasons the action is Arbitrary because the leasehold interests restrict and interfere with the right to travel of all citizens and all members of the public.	
BOEM-2024-0001-0528c	Beginning with offshore wind, transforming the ocean into a giant power plant. This despite the fact that the industry is in economic and technological turmoil, as evidenced by the abandonment of many projects by Ørsted and others, as well as technological challenges and failures, such as the inadequate grid to even accept the energy generated.	BOEM's responsibility under the Energy Policy Act of 2005 is to issue renewable energy leases, easements, and ROWs for activities on the OCS. The purpose of the PEIS is to identify issues and analyze potential impacts for the six NY Bight lease areas. Grid reliability is outside of BOEM's regulatory authority and the scope of the PEIS. The grid operator is responsible for managing the reliability of the grid. While offshore wind in the NY Bight would provide a new source of energy to the states of New York and New Jersey, other sources of energy would still be generated.
BOEM-2024-0001-0528c	And yet this PEIS seeks to streamline and expedite the issuance of these industrial scale offshore wind projects on these 6 lease areas which impact over nearly a half 1 million acres. To be clear, Clean Ocean action is not opposed to the idea of offshore wind, Clean Ocean Action opposes this reckless scope, scale and speed currently underway due to its lack of robust, independent science, transparency, good governance, and due diligence. Our ocean deserves better. A fair pilot project and independent cost benefit analysis, and also public transparency.	Thank you for your comment. The purpose of the Proposed Action is to describe issues, analyze degree of potential impacts, and identify, as appropriate, AMMM measures. BOEM is preparing this Final PEIS because of the close proximity of the six NY Bight lease area, their similar level of development due to the leases being awarded from the same auction, the close timing of the anticipated COP submissions, and the high, near-term demand from the states of New York and New Jersey for electricity generated by offshore wind. This PEIS will reduce redundancies across COP-specific NEPA analyses, including very similar affected environments, impacts, and mitigation measures, and it will allow for future project-specific NEPA documents to be focused on the project-specific impacts not considered in the PEIS or those impacts that warrant further consideration.

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		BOEM will still conduct project-specific NEPA analysis of the COP for each lease area, and it will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP NEPA stage. Further, BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project-specific COPs and EISs.
BOEM-2024-0001-0528f	Despite a growing demand for energy, the scale, scope, and speed of these offshore wind projects has continued to be a concern, but with this PES, it seems, the intent is to move even faster.	Thank you for your comment. The purpose of the Proposed Action is to describe issues, analyze degree of potential impacts, and identify, as appropriate, AMMM measures. BOEM is preparing this Final PEIS because of the close proximity of the six NY Bight lease areas, their similar level of development due to the leases being awarded from the same auction, the close timing of the anticipated COP submissions, and the high, near-term demand from the states of New York and New Jersey for electricity generated by offshore wind. This PEIS will reduce redundancies across COP-specific NEPA analyses, including very similar affected environments, impacts, and mitigation measures, and it will allow for future project-specific NEPA documents to be focused on the project-specific impacts not considered in the PEIS or those impacts that warrant further consideration. The expectation is that the analysis at the COP NEPA stage can be more streamlined and efficient. BOEM will still conduct project-specific NEPA analysis of the COP for each lease area, and it will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP NEPA stage.
BOEM-2024-0001-0528w	The environmental impacts of the individual projects will vary greatly, depending on which design elements they choose. Yet the PEIS would allow them to use, depending on the resource, the same characterization of the affected environment and or qualitative impacts estimated in the PEIS for the environmental reviews of the	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.

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	individual projects. This will expedite the environmental review process and threaten the quality of the analysis.	
BOEM-2024-0001-0529k	Instead, the government has set its sights primarily on fast tracking, massive ocean industrialization, transforming the ocean into a giant offshore power plant. Despite the fact that the industry is in economic and technological turmoil.	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.
BOEM-2024-0001-0529o	The scale, scope and speed of these offshore wind projects has always been a concern, but with this PEIS it seems the intent is to move even faster.	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.
BOEM-2024-0001-0529t	The stated purpose and need for this PEIS is to consider the combined impacts of these projects in order to streamline offshore wind development in response to President Biden's executive order calling for a certain amount of offshore wind energy to be to be developed by 2040, it's 11 gigawatts. This presupposes that offshore wind projects must be developed in this area which runs counter to the purpose of the National Environmental, Environmental Policy Act, which is to analyze the effects of projects before deciding to build them. The purpose in this section also incorrectly claims that BOEM can predict the environmental impacts of projects with wide ranges of design elements in a helpful way. Because choosing different foundations, different numbers of turbines or different types of substations, just to name a few examples, will have very different environmental impacts depending on which part of the range a developer chooses. That is likely why the range of impacts for the different factors can be as high as negligible to major. Yet the PEIS would allow BOEM to use, depending on the factor, the same characterization of the affected environment and the same qualitative impacts estimated in the PEIS and the environmental reviews of the individual projects. This is what we mean when we say that speeding up the environmental review process comes at the expense of the quality of the analysis.	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.
nguBOEM-2024-0001-0439-0008	In the introduction BOEM states that it is developing this Draft PEIS "to (1) identify analyze and [italicized: adopt] programmatic AMMM measures that could be applied to the six NY Bight lease areas."[Footnote 11: Draft PEIS at ES-1.] It appears that BOEM is proposing to use NEPA to impose substantive requirements on	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Instead, it is identifying those AMMM

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	lessees without identifying the authority for each of the AMMMs. As stated BOEM cannot use NEPA as the statutory mechanism to adopt these AMMM measures it can only rely on NEPA to analyze the impacts of adopting or not adopting said measures under other statutes. As discussed in detail below adopting AMMMs at the PEIS stage prior to COP review is contrary to BOEM's implementing regulations under OCSLA. The final PEIS and Record of Decision (ROD) should clarify that BOEM is [italicized: considering] rather than [italicized: adopting] the proposed AMMMs. In this way the PEIS does not inappropriately impose substantive requirements on projects but instead provides an analysis of these AMMMs which can help inform and provide a more efficient path to project specific environmental reviews and approval. As discussed below however this efficiency is only possible if the preferred alternative selected in the ROD considers only those AMMMs that are reasonable and economically and technically feasible.	measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

P.5.2 Proposed Action and Alternatives

Table P.5-2. Responses to Comments on the Proposed Action and Alternatives

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BOEM-2024-0001-0403-0002	The content of the PEIS is also grossly insufficient to account for the various impacts on nearly half a million acres of ocean land leased throughout the six lease areas: Bluepoint Wind Attentive Energy Community Offshore Wind Atlantic Shores Offshore Wind Bight Invenergy Wind Offshore and Vineyard Mid-Atlantic. Tellingly the record $4.3 billion secured through these leases indicates that the profitability of these leases far outweighs any real assessment of the impacts and consequences of industrializing one of our last untapped and pristine natural resources. The PEIS by BOEM's own estimation anticipates 1103 wind turbines 22 offshore substations 44 offshore export cables of 1772 miles in length and 1583 miles of inter array cables between the six projects throughout the Bight. The document sites estimated impacts from negligible to major in a variety of areas but without citing sufficient baseline data due to the absence of such	For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that will be included in the COP-specific NEPA analysis for each lease area. Each lease area will undergo project-specific environmental analyses through the development and submittal of a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. BOEM has prepared several EISs for offshore wind projects within the required page limits and has not found that the page limits prevent a thorough analysis.

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	data. To issue a PEIS on the six lease areas without the existence of baseline data and "because the size and design of the NY Bight wind farms are unknown at this stage" is shortsighted grossly inappropriate and negligent. Unfortunately, further issuance of project-specific Environmental Impact Statements have been hamstrung by the federal 2020 NEPA rule change which will limit future EISs to 150 to 300 pages for "proposals of unusual scope or complexity". This means that we will never fully understand the impacts and will be to borrow a term from NMFS "building the ship while sailing it."	
BOEM-2024-0001-0089-0001	The NY EIS should be discarded as submitted. There are numerous instances where knowledge gaps exist that are dismissed as inconsequential to the project. Examples include gaps in knowledge of EMF emissions impacting benthic layers and the authors suggest that ongoing studies taking place at Block Island Wind Farm which has consistently operated at a fraction of its stated capacity or not at all should suffice as evidence that the project should forge ahead. This is IRRESPONSIBLE!	The EMF and cable heat IPF discussion under Section 3.5.2.3, *Impacts of Alternative A – No Action on Benthic Resources*, does include a discussion of the differences between HVAC and HVDC and the type and intensity of the EMF they produce. Text has been added to this section and Section 3.5.2.5 stating that cable shielding required by BOEM would block electric fields emitted by HVDC and HVAC cables and that a weak induced electric field would be present if HVAC cables are used. Both sections discuss the impacts of any remaining EMF on benthic invertebrates. In addition, refer to response to comment BOEM-2024-0001-0400-0003 regarding data gaps, uncertainties, and incomplete and unavailable information. BOEM addresses this concern for each resource as required under CEQ regulations (40 CFR 1502.21) in PEIS Appendix E: *Analysis of Incomplete and Unavailable Information*. For NEPA purposes, BOEM believes the NEPA regulatory requirements regarding incomplete and unavailable information have been satisfied in the PEIS.
BOEM-2024-0001-0175-0004	[Bold: BPA:] I encourage you to read [Underline: The Toxic Wings - Damage and casualty of wind turbine blades] First English edition (May 2023): Jan Erik Weinbach Asbjrn Solberg og Brd-Einar Rimereit. THE TURBINE GROUP May 2023. The author states: "The entire western world has enumerated and adopted gigantic development targets with this unproven technology and that without having a scientific basis for the overall scope of consequences for HSE (health safety and environment). It is almost unbelievable and we know of no other industry that have been allowed such "Wild West" conditions ever. The closest we come to historical comparisons is to	Each lease area will undergo project-specific environmental analyses through the development and submittal of an SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. Calculation of rates is outside the scope of the PEIS and is the responsibility of grid operator and state.

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	the tobacco industry which for many decades was allowed to advertise that cigarettes were good for life and health even long after it was widely known that cigarettes have a very negative effect on life and health. Smoking cigarettes was an individual choice and the damage caused by these was largely self-inflicted. The toxic emissions from wind turbines are imposed on each and every one of us including the voiceless creatures of nature. The responsibility for this must and will be assigned to those who imposed this on us without a scientific basis about the consequences for life and health". There will be too many negative and irreversible impacts for the limited amount of energy we would get from offshore wind. The benefit will never out measure the costs. Lastly I would like to mention that to date the BPU cannot tell the ratepayers what will be our cost for this venture since offshore wind is built on subsidies which I believe is not economically responsible. I truly hope that you don't realize what will be lost until after it is gone.	
BOEM-2024-0001-0313-0006	1.3 Purpose and Need for the Proposed Action Page 1-5 states that "A broader approach to the NEPA analysis for the minimum of six COPs expected for the NY Bight lease areas is consistent with Executive Order 14008 "Tackling the Climate Crisis at Home and Abroad" issued on January 27 2021. In that order President Biden stated that the policy of his administration is "to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands waters and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth especially through innovation commercialization and deployment of clean energy technologies and infrastructure." To support the goals outlined in Executive Order 14008 the administration has also announced plans to increase renewable energy production with a goal of 30 gigawatts (GW) of offshore wind energy capacity by 2030. Potential development of the leaseholds would assist with meeting several state mandates for renewable energy. New Jersey's goal of 11 GW of offshore wind energy generation by 2040 is outlined in	The PEIS only analyzes six lease areas on the Atlantic OCS; other projects not analyzed in the PEIS would contribute to New Jersey and New York state goals. These include Empire Wind, Atlantic Shores North, and Atlantic Shores South. These other projects are analyzed as part of the cumulative effects analysis. The 5–7 GW expected from the six NY Bight lease areas is based on a conservative power ratio of 3 megawatts per square kilometer (MW/km^2). The NY Bight leases each have operations terms of 33 years that commence on the date of COP approval. Lessees may request an extension of their lease in accordance with lease terms and BOEM regulations. Cumulative impacts are addressed in the PEIS for each resource and for each alternative, including the No Action Alternative; the methodology is explained in PEIS Chapter 3, pages 3-1 through 3-3.

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	New Jersey Executive Order No. 307 issued on September 21 2022. New York's requirement of 9.0 GW of offshore wind energy generation by 2035 is outlined in the Climate Leadership and Community Protection Act signed into law on July 18 2019. Additionally an estimated 1618 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022). Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy." Comment: It is unclear how dedicating 48800 acres of lease area and the associated structures and disturbance meets the objectives specifically protection of public health; conservation of our lands waters and biodiversity stated above; in fact this project appears to directly contravene those policies. For context the entire Town of Oyster Bay comprises approximately 108 400 acres. The best-case scenario presented in the PEIS at full optimization of the project at 7GW is still less than the overly ambitious state mandate of 9GW of offshore wind energy further the lifespan of a WTG is only approximately 30 years. There is no discussion about the net generation of how these mandates will be achieved and how that figure is calculated into the equation upon expiration of the WTG's useful lifespan not only would it appear that a lease extension would be needed for continuous operation but WTGs would have to be decommissioned and replaced. The larger plans of scale and cumulative impacts must be adequately addressed in the final PEIS. Though the goals for alternative energy requirements are reiterated throughout the documents as a guiding qualifier for expeditiously proceeding with the review of these projects the details are omitted and unavailable thereby making it impossible to meaningfully review and consider the comprehensive cumulative synergistic direct and indirect impacts.	
BOEM-2024-0001-0331-0001	We are not opposed to clean energy in general and seek only that where it is pursued it be done in a reasonable and consistent manner and not leave major collateral damage in its wake. According to the Federal Register BOEM states that the purpose of the Draft PEIS is to	Thank you for your comment. BOEM shares the same goal to ensure projects are developed responsibly. The Final PEIS includes several identified AMMM measures (refer to Appendix

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	analyze the potential impacts of the New York Bight along with identifying possible changes to those impacts that could result from adopting certain avoidance minimization mitigation and monitoring measures (AMMM). After public input BOEM will decide on whether to adopt one or all of the AMMM measures outlined in the DPEIS and make them conditions of approval for activities proposed by the lessees in their construction and operation plans (COPS) or defer the decision to adopt such measures to each project-specific environmental review. According to the diagram about the process the PEIS analyzes the programmatic avoidance minimization mitigation and monitoring measures that could apply to the New York Bight leases and includes a focused regional cumulative analysis.	G) to avoid, minimize, and mitigate impacts from potential development of the six NY Bight lease areas.
BOEM-2024-0001-0331-0030	The BOEM PEIS lacks any discussion concerning intermittent offshore wind's contribution to grid unreliability how this will be mitigated and at what cost. For the first time in August 21 2023 the North American Electric Reliability Corporation (NERC) identified energy policy as a risk priority for grid reliability because the heightened legislative focus and mandates regarding decarbonization decentralization and electrification. The organization holds that the emerging resource mix is more susceptible to long-term widespread and extreme events like sustained loss of wind power. (https://www.nerc.com/news/Pages/Collective- Focus-Imperative-for-Mitigating-Emerging-Risks-to-Grid-Reliability.aspx) If the purpose of the projects is to meet the governor's goal by executive order for the State to sell 100% clean energy by 2035 including 11 GW of offshore wind how do the wind developers and BOEM propose to back up the wind when it is not blowing? What is the cost of this backup? What are the plans and cost of battery backup storage systems? According to Science Daily "energy droughts" in wind and solar can last a week. (DOE/Pacific Northwest National Laboratory December 11 2023) . BOEM and wind developers use a misleading measurement called a capacity factor in their discussions of offshore wind energy output but this number typically 50% - is misleading in that it is an average. This average does not account for the times when generated wind energy exceeds demand and when wind energy is less than demand. For example there could be days when	BOEM's responsibility under the Energy Policy Act of 2005 is to issue renewable energy leases, easements, and rights-of-way (ROWs) for activities on the OCS. The purpose of the PEIS is to present a programmatic analysis of the six NY Bight lease areas to characterize the types of impacts that could occur and mitigation measures that could minimize those effects. Grid reliability is outside of BOEM's regulatory authority and the scope of the PEIS. The grid operator is responsible for managing the reliability of the grid. While offshore wind in the NY Bight would provide a new source of energy to the states of New York and New Jersey, other sources of energy would still be generated. BOEM's calculations of capacity are an assessment of total lease capacity and are not used to estimate power operations. Costs for power are considered through state solicitations and are factored into utility rates. To date BOEM has not received COPs proposing battery energy storage systems. Other developers may choose to develop battery systems to capture offshore wind, and those projects would be required to be reviewed and permitted separately, although they would be outside BOEM's jurisdiction. However, the offshore wind projects do not require backup power or battery storage systems, and each project has independent utility.

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	the wind turbines are only producing 20% of their energy capacity but demand requires 80% capacity. There will be other days when wind energy supply will be at 70% of its capacity but demand will only be at 50%. A rigorous multiyear supply/demand accounting would inform us of the balancing costs back-up costs and grid costs related to the true issues of intermittency.	
BOEM-2024-0001-0334-0002	Be advised that the issues below as well as those you will receive from others represent a grave concern regarding BOEM's performance in protecting the interests of the New Jersey public. BOEM appears to ignore most of the significant impacts raised in their own EIS documents as well as the concerns raised by the well-researched public. The approvals of the projects to date seem to only ensure that the projects move forward with the appearance of having been fully vetted and the mainstream press bolsters that perception to the public. A critical viewpoint is now widespread and if successful will lead to new and increased pressures to prevent offshore wind projects from proceeding in New Jersey on the East Coast and around the coastal areas of the USA.	The PEIS was developed through coordination with federal agencies, Tribal Nations, and state and local partners, and the AMMM measures seek to avoid, minimize, or mitigate potential impacts. Project-specific NEPA analysis will provide additional site-specific data and incorporate advances in technology and understanding of these areas. Additional coordination with regulatory agencies is required as part of the approval of the project-specific approaches.
BOEM-2024-0001-0345-0003	New York City and Long Island are on the front lines of climate change. The NYSERDA white paper on the Climate Leadership and Community Protection Act asserts that one major obstacle the state faces to meet our climate change goals is that there is a "tale of two grids." Upstate uses 88% zero-emission resources but only represents 1/3rd of the energy load while downstate is 2/3rds of the load and 69% fossil fuels. The only way to see a just transition from polluting fossil fuels to renewable energy downstate is by utilizing offshore wind. New York has several offshore wind projects moving through the regulatory process which if approved will power millions of homes with clean renewable energy and bring New York significantly closer to our goal of 9000 MW of offshore wind. These projects are also kickstarting an "offshore wind-ustry" in the state which are already slated to create nearly 7000 jobs in project development manufacturing installation and operations and maintenance while creating over $12 billion in economic benefits to the state. They will also allow the state to close down antiquated polluting fossil fuel fired power plants which will improve air quality	Comment noted.

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	in our region and provide $1 billion in health benefits to New Yorkers in vulnerable and frontline communities.	
BOEM-2024-0001-0354-0017	True science involves constantly emerging new evidence and findings along with the ever-changing challenges imposed as to prior conclusions. As such contrary to the. Non-scientific "group think" and massive amounts of money driven public relations press releases behind the current wind turbine projects such sentiment ignores scientific methods of ongoing experimenting at the very least through realistic peer reviewed scientific pilot projects. True science involves constantly emerging new evidence and findings. This process necessarily continually involves the ongoing application of extensive scientific research which is then applied to the previously accepted theories. Such a true application of peer reviewed science especially applied to growingly_ obsolete wind turbine construction would support the revision if not rejection of prior dogma as to allegedly "settled science". As I have testified previously only from a partially facetious standpoint the rush to judgment approach as to this specific proposal to construct massive windfarms off New Jersey represents non-scientific "group think" with the devastating potential to trample upon scientific inquiry and research. Such immense pressure from those supporting such colossal development of this offshore industrial site off of the precious New Jersey Coast unfortunately has facilitated many knee-jerk feel-good reactions which totally ignore the required economic and scientific vetting process. During a prior era particularly relevant to the coast of New Jersey our town and I were subjected to enormous pressures exerted by those supporting ocean dumping. Generated by a foreign corporation's pipeline off our beautiful and incalculably valuable portion of the New Jersey shore. Similar subconscious and actual influences are once again being exerted in favor of a foreign corporation looking to create another potential ocean dumping site off New Jersey's shoreline. I would truly beseech BOEM officials to rise above the narrow bureaucratic rubber-stamping of the within proposal in favor of the true application of scientific method to the entire cumulative and indirect impacts of the current project as well to windfarms off of New Jersey's Coast in general. Just as one heartfelt objector testified in a virtual hearing as to the threats	This PEIS highlights regional issues; the details in the project-specific COP NEPA documents will provide additional site-specific information and incorporate advances in technology and scientific understanding as the projects advance. In addition, refer to response to comment BOEM-2024-0001-0400-0003 regarding data gaps, uncertainties, and incomplete and unavailable information. BOEM addresses this concern for each resource as required under CEQ regulations (40 CFR 1502.21) in PEIS Appendix E: *Analysis of Incomplete and Unavailable Information*. For NEPA purposes, BOEM believes the NEPA regulatory requirements regarding incomplete and unavailable information have been satisfied in the PEIS.

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	proposed by foreign corporations to our country's national symbol the bald eagle these threats are very real whether proposed by a non-American entity or a corporation based in our own country.	
BOEM-2024-0001-0355-0004	Unreliable energy so a back-up energy supply would still be needed.	Comment noted. Grid reliability is the responsibility of the state grid operators. While offshore wind in the NY Bight would provide a new source of energy to the states of New York and New Jersey, other sources of energy would still be generated.
BOEM-2024-0001-0355-0017	In addition it seems BOEM is rushing this process with little or no information. I am opposed to approval of the OSW projects at this time until MORE DATA AND MORE STUDIES are conducted. There are way too many unknowns and "insufficient data" per BOEMs PEIS. From p. 5 of the PEIS they state "The Atlantic OCS is considered by BOEM to be a "Frontier Region" where little information exists about the geologic conditions and how those conditions may impact development of offshore wind farms." On page 12 they state "site investigation and characterization for such projects is generally focused on a limited area." Does this make sense on a barrier island where the water table is high and you can compromise the water resource on one part and not another? How can you approve such a project without knowing so much of the necessary information to make a thoughtful decision that will affect SO MANY humans and marine creatures in multiple negative ways? At the very minimum there should be a pilot study done to collect more information on our specific region before going for this massive disruption to and destruction to marine life human life real estate and tourism.	Refer to response to comment BOEM-2024-0001-0400-0003 regarding data gaps, uncertainties, and incomplete and unavailable information. BOEM addresses this concern for each resource as required under CEQ regulations (40 CFR 1502.21) in PEIS Appendix E, *Analysis of Incomplete and Unavailable Information*. For NEPA purposes, BOEM believes the NEPA regulatory requirements regarding incomplete and unavailable information have been satisfied in the PEIS. In addition, this PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lease holder is required to conduct project-specific environmental analyses, which include development and submittal of a COP as required under 30 CFR 585.628. BOEM will conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures for each resource area discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area and cable route as the projects advance. Further, BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project specific COPs and EISs.

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BOEM-2024-0001-0356-0003	The second more recent information that has been acknowledged is inadequate is from the NJBPU published 2/14/24: "Atlantic hurricanes pose a significant potential threat to the State's burgeoning OSW sector. Despite this risk relatively little technical research has been devoted to quantifying and assessing Atlantic hurricane impact upon OSW projects. As a result regulators developers and insurers have limited tools at their disposal to mitigate this risk or ascertain whether the risk warrants design modifications. The prevailing uncertainty surrounding what is widely perceived as a substantial threat to OSW largely without scientific or engineering backing serves as a considerable obstacle to the development of OSW Development of advanced technical research quantifying and assessing hurricane risk is therefore necessary to aid developers regulators and insurers in mitigating hurricane risk and providing improved design standard baselines." These studies should've been performed and the results published long before any of the EIS's for any lease were approved. This is absolutely absurd and are yet more glaring reasons that OSW is being pushed through the regulatory processes prematurely and unchecked.	As stated in PEIS Section 2.3, the engineering specifications of the WTGs and their ability to sufficiently withstand weather events, including hurricane-level events, are independently evaluated by a certified verification agent when reviewing the Facility Design Report and Fabrication and Installation Report according to international standards. One of these standards calls for the structure to be able to withstand a 50-year return interval event. An additional standard includes withstanding 3-second gusts of a 500-year return interval event, which would correspond to Category 5 hurricane windspeeds. It is in the best interest of the lessees to construct and operate a viable project and minimize risk as much as possible; they are responsible for ensuring the WTGs are designed and constructed to withstand such events and to ensure the integrity of the structures would not be compromised.
BOEM-2024-0001-0357-0002	As requested by the BOEM the bulk of our comments here are on the New York Bight program EIS to make it a more useful document. However it is not the document that is of paramount concern here. Rather it is the BOEM decision making process itself relative to the requirements of the Administrative Procedures Act the Outer continental Shelf Lands Act and the National Environmental Policy Act and the dictates of common sense which we believe is fundamentally unreasonable and flawed in at least two major respects: First, the BOEM does not consider the full, real environmental impact to an area when it approves projects, and Second, it does not engage expert and other public input before it makes the most important decisions, i.e., on wind turbine location, number, megawatt size and gear drive. Both of these defects are discussed below.	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project, including cumulative effects. During the COP-specific NEPA process, BOEM will hold a public comment period at the start of the NEPA process (scoping) and, following that, will release the Draft NEPA document, whereby members of the public and agencies can provide input to help inform the NEPA process, alternatives, and mitigation measures to identify and minimize environmental effects. Additionally, throughout the NEPA process, BOEM will work closely with Cooperating Tribal Governments and federal and state agencies to assist with assessing impacts and identifying mitigation

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		measures. BOEM will analyze each COP as proposed by the developer and does not make decisions on number of turbines, MW size, and gear size that applicants include in the COP. BOEM may analyze different alternatives and mitigations—such as the number of turbines, MW size, and gear size—as part of the NEPA review process, project-specific consultations, and decision process.
BOEM-2024-0001-0362-0027	High-road Equitable Environmentally Responsible Development Outer Continental Shelf Lands Act BGA believes that standards for high-road equitable and environmentally responsible development are consistent with federal statute. In Section 8 of OCSLA Congress declared that it is the authority of the Secretary of the Interior (delegated to BOEM) to "grant a lease easement or right-of-way" for activities that "produce or support production transportation or transmission of energy from sources other than oil and gas" in a manner that provides for:"(A) Safety;(B) Protection of the environment;(C) Prevention of waste;(D) Conservation of the natural resources of the Outer Continental Shelf;(E) Coordination with relevant Federal agencies;(F) Protection of national security interests of the United States;(G) Protection of correlative rights in the Outer Continental Shelf;(H) A fair return to the United States;(I) Prevention of interferences with reasonable uses of the exclusive economic zone the high seas and the territorial seas;(J) Consideration of a. The location of and any schedule relating to a lease easement or right-of- way for an area of the Outer Continental Shelf; and b. Any other use of the sea or seabed including use for a fishery a sea lane a potential site of a deep-water port or navigation;(K) Public notice and comment on any proposal submitted for a lease easement or right-of-way under this subsection; and(L) Oversight inspection research monitoring and enforcement related to a lease easement or right-of-way under this subsection." [Footnote v: U.S. Code 1337 - Leases easements and rights-of-way on the outer Continental Shelf. https://www.law.cornell.edu/uscode/text/43/1337] High road standards touch on many of these imperatives including safety; protection of the environment; conservation of natural resources; protection of national security; fair return to the United States;	Comment noted. Section 1.4, *Regulatory Overview*, of the Final PEIS describes the regulatory authority for renewable energy leasing on the OCS.

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	consideration of other uses; and oversight inspection and resource monitoring. Environmentally responsible development robust stakeholder engagement equitable distribution of benefits and attention to quality job creation domestically are all foundational to OCSLA requirements. In addition to the authority granted to BOEM to facilitate energy development on the Outer Continental Shelf (OCS) the president has authority to direct requirements on leases of the OCS and precedent exists for the president to do so. Current BOEM leases include terms mandated by presidential Executive Order 11246 which prohibits employment discrimination and establishes affirmative action requirements for nonexempt federal contractors and subcontractors. [Footnote vi: DOL Executive Order 11246 Equal Employment Opportunity Sept. 24 1965. https://www.dol.gov/agencies/ofccp/executive-order-11246/as-amended] Article II 1 of the U.S. Constitution provides that "executive power shall be vested in" the president. Such power gives the president the right in the absence of an express congressional declaration to the contrary to control the terms upon which public lands or property may be sold leased or used by private individuals or entities. [Footnote vii: Case text United States v. Midwest Oil Co. Feb. 23 1915. Available online: https://casetext.com/case/united-states-v-midwest- oil-co]	
BOEM-2024-0001-0362-0028	In Executive Order 14008 Tackling the Climate Crisis at Home and Abroad issued January 27 2021 President Biden stated that it is the policy of the United States: "to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands waters and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth especially through innovation commercialization and deployment of clean energy technologies and infrastructure." This executive order further emphasizes that "[t]his Nation needs millions of construction manufacturing engineering and skilled-trades workers to build a new American infrastructure and clean energy economy." [Footnote ix: White House Executive Order on Tackling the Climate Crisis at Home and Abroad Jan. 27	Comment noted. Section 1.3, *Purpose of and Need for the Proposed Action*, describes the purpose of the Proposed Action, which supports Executive Order 14008 “Tackling the Climate Crisis at Home and Abroad.”

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	2021. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at- home-and-abroad/] President Biden further states "Agencies shall seek to increase the Federal Government's resilience against supply chain disruptions. Such disruptions put the Nation's manufacturing sector at risk as well as consumer access to critical goods and services." Additionally President Biden directed all agencies to "adhere to the requirements of the Made in America Laws in making clean energy energy efficiency and clean energy procurement decisions" consistent with Executive Order 14005 Ensuring the Future Is Made in All of America by All of America's Workers. [Footnote x: White House Executive Order on Ensuring the Future Is Made in All of America by All of America's Workers Jan. 25 2021. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/25/executive-order-on-ensuring-the-future-is-made-in- all-of-america-by-all-of-americas-workers/] President Biden has also emphasized the need to maximize utilization of domestic content as we advance climate and clean energy solutions in order to strengthen U.S. manufacturing. President Biden's executive order on America's supply chains issued February 24 2021 states "[t]he United States needs resilient diverse and secure supply chains to ensure our economic prosperity and national security." It continues to say "resilient American supply chains will revitalize and rebuild domestic manufacturing capacity maintain America's competitive edge in research and development and create well-paying jobs. They will also support small businesses promote prosperity advance the fight against climate change and encourage economic growth in communities of color and economically distressed areas."	
BOEM-2024-0001-0362-0029	Executive Orders on Domestic Manufacturing Environmental Justice and Union Labor President Biden has reinforced in various executive orders that it is the policy of the federal government to pursue solutions to the climate crisis with attention to union labor domestic manufacturing environmental justice and protection of natural resources. The announcement of the national offshore wind target to deploy 30 gigawatts (GW) of offshore wind by 2030 further underscored this approach. The White House fact sheet containing that announcement declared: "The President recognizes that a	Comment noted. Section 1.3, *Purpose of and Need for the Proposed Action*, describes the purpose of the Proposed Action, which supports President Biden administration's goal of 30 GW of offshore wind capacity by 2030.

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	thriving offshore wind industry will drive new jobs and economic opportunity up and down the Atlantic Coast in the Gulf of Mexico and in Pacific waters. The industry will also spawn new supply chains that stretch into America's heartland as illustrated by the 10000 tons of domestic steel that workers in Alabama and West Virginia are supplying to a Texas shipyard where Dominion Energy is building the Nation's first Jones Act compliant turbine installation vessel. "Federal leadership in close coordination with states and in partnership with the private sector unions and other key stakeholders is needed to catalyze the deployment of offshore wind at scale. "the Administration is taking coordinated steps to support rapid offshore wind deployment and job creation:1. Advance ambitious wind energy projects to create good-paying union jobs2. Investing in American infrastructure to strengthen the domestic supply chain and deploy offshore wind energy3. Supporting critical research and data-sharing." [Footnote viii: White House FACT SHEET: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs March 29 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts- offshore-wind-energy-projects-to-create-jobs/]	
BOEM-2024-0001-0362-0031	Recent global events have made it abundantly clear that our national security is strongly tied to our energy security to which domestic manufacturing plays a critical role. The U.S. Department of Energy and the North American Electric Reliability Corporation jointly-commissioned a report assessing risks to the U.S. electricity generation and distribution infrastructure. The summary of the report observed that the "bulk power system is dependent on long supply chains often with non-domestic sources and links" and determined that the "increased reliance on foreign manufacturers with critical components and essential spare parts manufactured abroad (e.g. HV transformers)" means the "supply chain itself represents an important potential vulnerability." [Footnote xv: North American Electric Reliability Corporation High-Impact Low-Frequency Event Risk Impact to the North American Bulk Power System at page 30 (June 2010). https://www.energy.gov/ceser/downloads/high-impact-low-frequency-risk-north-american- bulk-power-system-june-	Comment noted.

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	2010.] The report recommends that "efforts should be considered to bring more of the supply chain and manufacturing base for these critical assets back to North America." [Footnote xvi: Ibid at 27]	
BOEM-2024-0001-0383-0007	OSCLA: BOEM quotes the Outer Continental Shelf Lands Act regarding the Secretary's legislative requirement to "ensure that any activity under [subsection 8(p)] is carried out in a manner that provides for (A) safety; (B) protection of the environment.. (I) prevention of interference with reasonable uses (as determined by the Secretary) of the exclusive economic zone the high seas and the territorial seas.." etc. [Footnote 21: PEIS at New York Bight Draft Programmatic Environmental Impact Statement Volume 1 Chapters 1-4 (boem.gov) p. 1-6 1-7.] The agency then quotes a 2021 agency memo that states that the law as written in fact does not require the Secretary to ensure achievement of these various "goals" but to balance them.[Footnote 22: Ibid p. 1-7.]We disagree. The term "ensure" means "ensure". It does not mean balance. By not ensuring safety by not ensuring prevention of interference with reasonable uses- such as federally permitted commercial fishing on the OCS-BOEM is in violation of the law. The agency cannot rewrite the meaning of the word "ensure" with an internal agency memo. Furthermore the agency memo written in 2021 directly contradicts a corresponding agency memo written only five months prior in 2020. We have attached that memo along with this comment. The 2021 memo purports to overturn the previous 2020 memo this reinterpretation coinciding with a change in Administration but the law cannot mean two different things. Simply because an Administration changes does not mean that the law changes. Congress changed nothing. The definition of the word "ensure" did not change in the English language between 2020 and 2021.BOEM cannot add words to statute that do not exist in the statute; it must take the legislative language at face value. The PEIS states that the law imposes only a "a general duty" and "does not require the Secretary to ensure that the goals are achieved to a particular degree" but allows the Secretary to "balance" what it refers to as "goals". These listed requirements are not goals; they are legal standards. The law says the Secretary must "ensure" that these legislative standards are met. The word "ensure" defined by	The Solicitor’s Opinion of December 14, 2020, M-37059, was withdrawn on April 9, 2021, by M-37067 for the reasons explained in the latter opinion. The Solicitor’s M-opinions on matters within the jurisdiction of the Department of the Interior (DOI) are binding on BOEM (see 209 Department Manual 3.2(A)(11)). Therefore, BOEM is bound to follow the interpretation of the OCSLA put forth in M-Opinion 37607.

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	Merriam-Webster means "to make sure certain or safe: guarantee." [Footnote 23: See Ensure Definition & Meaning - Merriam-Webster.] The Secretary must guarantee these standards. It is clear from the discussion on navigational impacts in the AMMM section below the commercial fishing impacts contained in our attached USCG comments as well as the lack of regulatory benchmarks regarding high resolution geophysical surveys discussed below- which requires stronger regulatory protections by both BOEM and NOAA when being conducted in the Gulf of Mexico by other offshore energy industries than in the Atlantic by offshore wind developers- that BOEM is not guaranteeing that these OSCLA standards are met.	
BOEM-2024-0001-0406-0008	BOEM's Proposed Action Violates NEPA and the APA BOEM's proposed action "the adoption of AMMM measures such that the potential impacts described in Alternative B may be avoided reduced or mitigated" Draft PEIS 2.1.3 (p. 2-16) would run afoul of both NEPA and the Administrative Procedures Act (APA) creating considerable legal risk for BOEM and jeopardizing the utility of its programmatic NEPA analysis if BOEM does not amend the proposed action in its Final PEIS. As BOEM describes it in the Draft PEIS the proposed action calls for "adopting programmatic AMMM measures that BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective." Draft PEIS 1.3 (p.1-4) (emphasis added). BOEM then states that "[t]he Record of Decision (ROD) for the PEIS will state which of the AMMM measures analyzed in the PEIS BOEM has committed to adopting and if not why they were not adopted." Id. This proposed action would establish for the six NYB lessees a presumption at COP review that BOEM will impose the full suite of AMMM measures from the Final PEIS on their projects unless the lessees can make a specific showing in their COPs that specific measures are not "warranted or effective." This approach unlawfully shifts the burden from BOEM to the lessee an approach which is legally problematic in at least two key respects.	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing a presumption at COP review that a lessee would need to rebut—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0406-0009	BOEM's Proposed Action Inappropriately Imposes Substantive Obligations Through a Procedural Statute NEPA is a procedural statute requiring an agency to analyze the environmental impacts of	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six

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	a proposed federal action. 42 U.S.C. 4331. While the NEPA regulations obligate an agency to provide a "detailed discussion of possible mitigation measures" when preparing an EIS it does not impose "a substantive requirement that a complete mitigation plan be actually formulated and adopted." Robertson v. Methow Valley Citizens Council 490 U.S. 332 35152 (1989). Thus while BOEM has appropriately discussed in detail the AMMM measures that could be applied during COP-specific NEPA analysis any adoption of those measures must be done through substantive statutes that grant BOEM and other permitting agencies the authority to require such measures. In this case BOEM's substantive authority to impose mitigation measures derives from the Outer Continental Shelf Lands Act (OCSLA) and its implementing regulations. In particular 30 CFR 585.620-628 establishes the COP review process and states that BOEM "will prepare an appropriate NEPA analysis" id. At 628(b) and then "upon completion of technical and environmental reviews will specify terms and conditions to be incorporated into the COP." Id. At 628(f)(1). Because BOEM's authority to impose mitigation measures is explicitly contingent on its review of a submitted COP it would be premature to invoke that authority in a PEIS. Moreover as noted above many of the proposed AMMM measures lie outside of BOEM's statutory and regulatory authority and would need to be "adopted" by other federal state and/or local agencies (if indeed they could be required or enforced at all). By proposing to "adopt" AMMM measures in a programmatic NEPA document divorced from an OCSLA decision point BOEM effectively and illegally converts NEPA to a substantive statute.[Footnote 1: It is no defense that BOEM would retain the discretion to not impose particular AMMM measures if lessees can demonstrate in their COPs that an "adopted" measure is not "warranted or effective." The proposed action still would constitute a substantive imposition of AMMM measures before COP submittal with the burden now shifted to lessees to prove in their COPs that such measures should not be required.]	NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing any substantive obligations at this programmatic stage—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0406-0010	BOEM's Proposed Action Appears to Constitute a De Facto Rulemaking in Violation of the APA By imposing a new standard of review on all projects within the NY Bight BOEM has also effectively engaged in de facto rulemaking in	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as

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	violation of the APA. Subject to very limited exceptions the APA requires that any adoption of or amendment to a federal regulation go through the notice and comment rulemaking process. 5 U.S.C. 553. Substantive agency rules which change or impose rights and obligations of regulated parties may not be imposed through informal pronouncements; to do so represents a violation of the APA's rulemaking procedure. See e.g. Cmty. Nutrition Inst. V. Young 818 F.2d 943 946-47 (D.C. Cir. 1987); see also Phillips Petroleum Co. v. Johnson 22 F.3d 616 621 (5th Cir. 1994) ("A party may not be adversely affected by a [substantive] rule in violation of [APA notice and comment] requirements."). BOEM's proposed action while not styled as an amendment to its regulations imposes a new standard that upends the COP review process established in BOEM's existing regulations and seeks to apply a new set of requirements (i.e. the full suite of AMMM measures) to all offshore wind projects in the NY Bight. As noted in the section above BOEM's regulations require that it "specify terms and conditions" of COP approval "upon completion of technical and environmental reviews" of a submitted COP. 30 CFR 585.628(f)(1). If the ROD is issued as BOEM proposes all six NYB lessees would face a presumptive array of requirements prior to submitting a COP and prior to BOEM conducting any of its environmental or technical reviews of those COPs. The lessees would then be required to demonstrate in their COPs that individual measures are not "warranted or effective" a standard found nowhere in OCSLA or BOEM's regulations. This would create a new standard of review that effectively shifts BOEM's burden to demonstrate that specific AMMM measures are needed based on its review of the project to the lessees. That is exactly the type of change in the rights and obligations of regulated parties that can only be done through notice and comment rulemaking.[Footnote 2: The fact that this particular Draft PEIS "only" applies to six lessees is of little consequence. BOEM is in the process of conducting a similar programmatic review for its five California leases see https://www.boem.gov/renewable-energy/state-activities/california-offshore-wind-programmatic-environmental-impact and has given every indication that it will continue to use the PEIS mechanism to create efficiencies in its future COP reviews. It is	conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas.. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Nor does the proposed action purport to change the standard in BOEM's regulations governing review of COPs. For those reasons, the proposed action is not a de facto rulemaking. Instead, it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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	reasonable to expect that the choices BOEM makes in this PEIS process will inform subsequent programmatic reviews in other wind energy areas.	
BOEM-2024-0001-0406-0029	Finally BOEM should also consider declining to issue a ROD with the Final PEIS. Even in its draft form the PEIS does not make any "decisions" that trigger environmental effects and that remains the case if revised as suggested herein. No decision of that sort is made until BOEM makes a decision on an individual COP that has been the subject of a full-blown EIS. Any decision flowing from this PEIS is therefore premature. Moreover there is no formal requirement in NEPA the CEQ regulations or Department of the Interior (DOI) regulations that a programmatic NEPA analysis must include a ROD if no decision is being made. Eliminating the ROD would make clear to the public that this PEIS is primarily intended to facilitate early identification and analysis of important issues and impacts common to all NYB leases and not to narrow BOEM's or lessees' options at the COP stage or impose substantive requirements as with the presumptive application of the full suite of AMMM measures analyzed in the Draft PEIS.	Comment noted. A ROD could identify those AMMM measures BOEM may apply as conditions of approval for the COPs submitted for the NY Bight leases. This documentation does not constitute final agency action but may be integrated into the ROD for each individual project. Identification of the measures BOEM may apply does not narrow options at the COP stage because BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.
BOEM-2024-0001-0423-0001	A rational and timely permitting process is vital to meeting the goals of Executive Order 14008 ("Tackling the Climate Crisis at Home and Abroad" issued on January 27 2021) New Jersey's goal of 11 GW of offshore wind energy generation by 2040 (as outlined in New Jersey Executive Order No. 307 issued on September 21 2022) and New York's requirement of 9.0 GW of offshore wind energy generation by 2035 (as outlined in the Climate Leadership and Community Protection Act signed into law on July 18 2019). The permitting process for offshore wind is already extremely robust and Ocean Winds had expressed concern when the New York Bight PEIS process was announced as we feared that the PEIS had the potential to complicate and delay an already challenging process. Setting aside those concerns our Bluepoint Wind team has been working cooperatively with BOEM since it published its Notice of Intention (NOI) to prepare a PEIS on July 15 2022. The eighteen months between NOI and Draft PEIS is concerning and is impacting development of Construction and Operation Plans (COPs) for NY Bight lessees. It is disappointing that initial promises from BOEM that	Comment noted.

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	this PEIS will speed and not hinder project permitting and development do not seem to be materializing. That said Ocean Winds hopes that the Final PEIS will be issued on schedule and future PEIS efforts will proceed in a more expeditious manner. Further we note that this PEIS will set a precedent for the PEIS process in California and beyond. As such we urge BOEM to be thoughtful in its approach so that its actions in this process do not hinder development of an industry already facing a series of challenges on both coasts.	
BOEM-2024-0001-0423-0030	Purpose and Need for the Proposed Action Ocean Winds supports the [bold and italicized: intent] of the PEIS namely to reduce redundancies across COP-specific NEPA analyses and help BOEM make timely decisions on COPs for the six lease areas covered by the Draft PEIS. Rather than leading to a more efficient process for individual COP approvals the scale and scope of the proposed AMMMs represent a significant expansion beyond past precedent and ensures a longer process for reviewing individual COPs when developers inevitably consider alternatives to the AMMMs in their individual COP submittals. This in turn will lengthen and complicate what is already a challenging federal permitting process. The Draft PEIS continues a troubling trend of the federal government continuing to raise the bar for offshore wind when compared to other maritime industries many of which are known to cause meaningful negative impact to the sensitive resources that the AMMMs proposed in the Draft PEIS are intended to protect. Ocean Winds also notes that the six months-long delay in the release of the Draft PEIS has negatively impacted project timelines which hinder the purpose and need of BOEM making timely decisions on COPs for the NY Bight leases and we urge BOEM not to allow further delays to the Final PEIS. As discussed above the delay associated with this PEIS along with the overreach in the substance of the document sets a concerning precedent for future PEIS processes.	The AMMM measures considered in the PEIS include measures that have been included in previous COP approvals, as well as those proposed through the scoping process. In response to numerous comments on the Draft PEIS AMMM measures, BOEM has reviewed all AMMM measures and has made several changes to the measures as presented in Final PEIS Appendix G. In summary, BOEM has split the AMMM measures into AMMM measures that BOEM has required as conditions of approval from previous activities proposed by lessees in COPs submitted and AMMM measures that have not been applied as terms and conditions of approval for previous activities proposed by lessees in COPs. In addition, BOEM has identified RPs that could be considered at the project-specific COP NEPA review. Refer to response to comment BOEM-2024-0001-0371-0004 regarding revisions to Alternative C. Further, this PEIS is *not imposing* any AMMM measures; it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient. Regarding PEIS timelines and delays, BOEM is working as efficiently as possible to ensure an adequate NEPA document is developed that meets all the statutory and regulatory requirements.
BOEM-2024-0001-0426-0002	History is full of bad government decisions that seemed like a good idea at the time. Take the Homestead Act for example where settlers were given free acreage in Kansas Oklahoma East Texas and	BOEM analyzes offshore wind projects using the best available science and information and seeks input from the public, agencies, and Tribal Nations to inform its decisions. For the PEIS,

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	elsewhere to farm. The governments' objectives were economic development continuation of a young country's "Manifest Destiny" westward and an increase in agricultural production. Most settlers farmed land or grazed cattle but soon unanticipated consequences began to appear. Farmers plowed over prairie grasses and planted dryland wheat. As the demand for wheat grew cattle grazing decreased and more acres were plowed and planted. When the world market for wheat became oversupplied prices dropped and farmers reacted to their loss of revenue by planting more wheat to make up on volume what they were losing on price. This dry land farming led to the systematic destruction of prairie grass. With the land gradually being stripped bare environmental damage began to occur. Finally with the drought of 1930 over farmed land blew away. The heartland of the U.S. became a vast dust bowl. An article by Jonathan Coppess from the University of Illinois Urbana-Champaign on the Dust Bowl offers haunting parallels for New Jersey clean energy policy:’’ As one of the worst environmental disasters in our history the Dust Bowl was a confluence of policy human activities climatic shifts and the outer bounds of nature’s tolerance. It should counsel humility about the ability of humans to perpetually push natural resources for their benefit The dust bowl was triggered by an extreme drought -part of a natural cycle over which we had little knowledge and Jess control - but it had been built by policies and misguided actions in an unfamiliar environment" Into the Unknown An often-quoted remark from Donald Rumsfeld former Secretary of Defense during a discussion linking Iraq with weapons of mass destruction states:" Reports that say that something hasn't happened are always interesting to me because as we know there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns-the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries it is the latter category that tends to be the difficult one." Known Unknows and Unknown. Unknows	BOEM has identified information that was incomplete or unavailable for the evaluation of reasonably foreseeable impacts in Appendix E, *Analysis of Incomplete and Unavailable Information*.

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	So are there any "known unknowns" and more troubling "unknown unknowns" lurking beneath the surface of efforts to accelerate offshore wind development?	
BOEM-2024-0001-0426-0008	Here at home PSE&G and Eversource have backed off from prior investment commitments to offshore wind. Do we understand why? There are other questions as well that have barely been explored at least publicly. Regarding national security an open field of hundreds of turbines in the middle of the Atlantic is an inviting soft target for terrorists or adversarial nations. How will we defend these resources?	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. Questions related to financial investments and national security are outside the scope of the PEIS. As stated in PEIS Section 2.3, non-routine activities and events, such as a terrorist attacks, are impossible to predict with certainty and are not analyzed in detail. In addition, PEIS Appendix E, *Analysis of Incomplete and Unavailable Information*, Section E.1.17, states that there is uncertainty regarding national security, but that the information that is available is appropriate for this programmatic level of analysis. Subsequent project-specific environmental analysis will be required for each individual COP.
BOEM-2024-0001-0439-0003	To address these concerns, the OSW industry urges BOEM to ensure that the final PEIS does not impose new analytical burdens or substantive requirements on lessees but instead serves as an analytical tool that improves the efficiency of the environmental review of COP-specific proposals within the NY Bight through tiering. To ensure this outcome: The Purpose and Need of the Proposed Action should be an analysis of AMMMs that BOEM *may* consider as conditions of approval.	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not establishing any substantive obligations at this programmatic stage—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0439-0007	BOEM should not adopt AMMMs through NEPA. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions.[Footnote 5: 42 U.S.C. 4331.] Importantly NEPA is merely a procedural statute- it authorizes the use of substantive authorities for improved environmental outcomes but imposes no substantive requirements.[Footnote 6: NEPA only requires a "reasonably complete discussion of possible mitigation measures" to allow for a fair evaluation of avoidable and unavoidable environmental consequences.[Footnote 7: See id. At 352.] The Supreme Court has	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Instead, it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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	warned that there is no requirement under NEPA "that a complete mitigation plan be actually formulated and adopted."[Footnote 8: Id.] Indeed the Court has held that it would be "inconsistent" with NEPA's procedural focus "to demand the presence of a fully developed plan that will mitigate environmental harm."[Footnote 9: Id. At 353; see also Citizens Against Burlington Inc. v. Busey 938 F.2d 190 205-06 (D.C. Cir.) (agency not required to finish mitigation studies or execute mitigation plans before project begins) cert. denied 502 U.S. 994 (1991); Communities Inc. v. Busey 956 F.2d 619 625-26 (6th Cir.) (EIS lacking complete remediation plan adequate where sufficient investigation was conducted to identify mitigation alternatives and make reasonable estimate of cost) cert. denied 506 U.S. 953 (1992).] In short NEPA requires agencies to take a "hard look" at the environmental impacts of actions being proposed under substantive statutes over which they have authority such as OCSLA. NEPA itself does not provide authority to impose requirements or limit actions.[Footnote 10: Ibid. at 351.("other statutes may impose substantive environmental obligations on federal agencies but NEPA merely prohibits uninformed rather than unwise agency action.")]	
nguBOEM-2024-0001-0439-0008	In the introduction BOEM states that it is developing this Draft PEIS "to (1) identify analyze and [italicized: adopt] programmatic AMMM measures that could be applied to the six NY Bight lease areas."[Footnote 11: Draft PEIS at ES-1.] It appears that BOEM is proposing to use NEPA to impose substantive requirements on lessees without identifying the authority for each of the AMMMs. As stated BOEM cannot use NEPA as the statutory mechanism to adopt these AMMM measures it can only rely on NEPA to analyze the impacts of adopting or not adopting said measures under other statutes. As discussed in detail below adopting AMMMs at the PEIS stage prior to COP review is contrary to BOEM’s implementing regulations under OCSLA. The final PEIS and Record of Decision (ROD) should clarify that BOEM is [italicized: considering] rather than [italicized: adopting] the proposed AMMMs. In this way the PEIS does not inappropriately impose substantive requirements on projects but instead provides an analysis of these AMMMs which can help inform and provide a more efficient path to project specific environmental reviews and approval. As discussed below however	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Instead, it is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

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	this efficiency is only possible if the preferred alternative selected in the ROD considers only those AMMMs that are reasonable and economically and technically feasible.	
BOEM-2024-0001-0439-0009	The Purpose and Need of the Proposed Action inappropriately shifts burden to developers. The Proposed Action proposes to "[adopt] measures *unless* future COP-specific NEPA analysis shows that implementation of measures is not warranted or effective"[Footnote 12: Draft PEIS ES-3.] Separate from the issue of adopting substantive measures discussed above the proposal to wait for site specific analysis to show that a measure is not warranted inappropriately shifts the burden to developers to prove that specific AMMMs should not be imposed at the COP approval stage. This will significantly increase the costs to developers to study analyze and disprove the appropriateness of certain measures. This is a burden found in neither NEPA nor BOEM regulations nor other reviewing statutes. The final PEIS should not require site-specific analysis to disprove the need for prematurely adopted AMMMs. Rather the PEIS should help inform the site-specific NEPA review but ultimately the analysis in the site-specific NEPA document should determine which AMMMs are reasonable and necessary for the project under review.	In an effort to create a more efficient process, the PEIS analyzes AMMM measures that have been applied previously through the COP-specific NEPA process. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not shifting the burden to developers—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient. In addition, see response to comment BOEM-2024-0001-0423-0030 regarding BOEM's review and revisions of AMMM measures in the PEIS and identification of RPs.
BOEM-2024-0001-0439-0010	The Purpose and Need of the Proposed Action The Adoption of AMMMs is contrary to BOEM's authority under OCSLA and NEPA. BOEM states that the Proposed Action for the Draft PEIS is "the adoption of programmatic AMMM measures that BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of measures is not warranted or effective."[Footnote 13: Draft PEIS ES-3.] Stating that BOEM "would require" the AMMMs as conditions of approval is contrary to BOEM's authority under OCSLA's implementing regulations. First under BOEM's implementing regulations the agency cannot use a PEIS to "pre-approve" COP terms and conditions. Doing so prematurely imposes a substantive burden on lessees and inappropriately preempts the COP approval process. BOEM regulations outlining the COP approval process state that BOEM conducts an environmental review once the lessee has submitted a COP and that "upon completion of our technical and	The Proposed Action for the Final PEIS includes the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. These measures may be required as conditions of approval for activities proposed by lessees in the COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not prematurely adopting AMMM measures through the PEIS—but is identifying those AMMM measures that BOEM

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	environmental reviews and other reviews required by Federal Law BOEM may approve disapprove or approve with modifications your COP. If we approve your COP we will specify terms and conditions to be incorporated into your COP."[Footnote 14: 30 C.F.R. 585.628(f).] Importantly BOEM approves a COP including mitigation measures upon completion of the environmental review. In short as required by regulation a lessee submits a COP which includes proposed measures to reduce impacts from the proposed activities within the COP to BOEM. BOEM subsequently reviews the COP for completeness and sufficiency and conducts an environmental review on the COP. It is at this stage that BOEM determines which AMMMs should be included in the environmental review for analysis and which AMMMs should be selected for adoption as terms and conditions of plan approval. In contradiction to these regulations BOEM is proposing to rely on this PEIS to prematurely adopt AMMMs prior to COP review and approval. While BOEM can certainly rely on a PEIS to analyze the impacts of appropriate AMMMs (as discussed in more detail below) it should not use the PEIS as authority to impose a substantive burden on a lessee prior to the COP review and approval.[Footnote 15: As noted in the section below it is no defense that a lessee may theoretically rebut the adoption of an AMMM at the COP stage by demonstrating that it is not "warranted or effective." This new burden is not found in BOEM's regulations.]	may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.
BOEM-2024-0001-0439-0011	Premature adoption of AMMMs may also inadvertently overlook consultation processes such as under the Endangered Species Act (ESA) which begins with review of a fully developed site- specific action in sufficient detail to assess the effects of the action on listed species and critical habitat.[Footnote 16: 50 C.F.R. 402.14(c)(1)(i) (requiring detailed description of proposed action to initiate ESA consultation).] If the activity is allowed by an incidental take statement any reasonable and prudent measures imposed as a result of the ESA process "cannot alter the basic design location scope duration or timing of the action and may involve only minor changes."[Footnote 17: Id. 402.14(i)(2).] Similarly the Marine Mammal Protection Act ("MMPA") authorization process begins with a developer's application to conduct site-specific activities and any	BOEM has modified the PEIS language describing the Proposed Action and refined the language throughout the PEIS to make clear that this PEIS is *not imposing* any AMMM measures—and therefore is not prematurely adopting AMMM measures through the PEIS—but is identifying those AMMM measures that BOEM may impose at the COP-specific NEPA stage. Because those AMMM measures are identified and analyzed now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient. Identification of AMMM measures through the PEIS process would supplement and inform but not supplant the identification of measures at the project-level ESA consultation. Based on comments provided on the Draft PEIS, BOEM revised AMMM measures as presented in

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	conditions imposed must be "practicable" and may not unduly interfere with the activity's implementation.[Footnote 18: 16 U.S.C. 1371(a)(5)(A)(i)(II)(aa) ("practicable" requirement for conditions in incidental take regulations provision); id. 1371(a)(5)(D)(ii)(I) ("practicable" requirement for conditions in incidental harassment authorizations); see Nat. Res. Def. Council Inc. v. Pritzker 828 F.3d 1125 1134-35 (9th Cir. 2016) (interpreting "least practicable adverse impact" requirement under 16 U.S.C. 1371(a)(5)(A)(i)(II)(aa)); id. At 1135 n.9. (eliminating 99% of oceans from sonar activity would be more protective of marine mammals "[b]ut it would not be practicable because it would so restrict military options for readiness training that it would render such training ineffective").] Other environmental review statutes including the Clean Air Act and the Clean Water Act contain similar requirements to review site- specific plans and limit agencies' conditioning authority over proposed activities.[Footnote 19: 40 C.F.R. 1502.24 (To the fullest extent possible agencies shall prepare draft environmental impact statements concurrent and integrated with environmental impact analyses and related surveys and studies required by all other Federal environmental review laws and Executive orders applicable to the proposed action including the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) the National Historic Preservation Act of 1966 (54 U.S.C. 300101 et seq.) and the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).] As such any AMMMs that would potentially be required under the ESA MMPA or other environmental statutes should not be adopted prior to the completion of the consultation process. In the final PEIS, BOEM should clarify that the Proposed Action is an analysis of AMMMs that BOEM may consider as conditions of approval. As such future site-specific analysis would determine whether an AMMM considered in the draft PEIS is warranted rather than determining whether such measure is [italicized: not warranted.] Under this scenario BOEM would still rely on the PEIS to provide an environmental analysis of impacts and to tier site-specific reviews but it would not prematurely require the adoption of specific AMMMs. The final PEIS would include an analysis of all reasonable AMMMs that BOEM may require as terms and conditions of COP approval. BOEM would not be required to re-	Appendix G. Some of these measures would mitigate impacts on ESA-listed species. During project-level ESA consultation, agencies may identify additional measures to minimize effects on federally listed species.

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	analyze each AMMM included in the final PEIS when reviewing and approving a COP. As such the final PEIS would allow for consistency standardization and a more efficient environmental review process at the site-specific level.	
BOEM-2024-0001-0452-0001	Purpose of a PEIS We applaud BOEM for initiating this Programmatic Environmental Impact Statement (PEIS) specific to mitigation measures for regional OSW projects. This action appears partially responsive to longstanding fishing industry requests to better assess the cumulative impacts of the numerous OSW projects in the permitting pipeline and to conduct dedicated analyses regarding fisheries-specific mitigation measures that should be included as Terms and Conditions of any OSW project approval. [Footnote 10: As described in later sections of these comments a PEIS can only meet BOEM's obligations to avoid minimize and mitigate impacts to the environment if conducted in advance of lease issuance and if it includes all activities related to the proposed action in this case the multiple phases of OSW development. Instead the timing of this PEIS after leases have been issued results in the most meaningful opportunities to avoid impacts identified through environmental review to have already been lost.] The federal OSW leasing program needs substantially more attention devoted toward developing and incorporating fisheries and ecosystem data not less and this PEIS should not result in reduced scrutiny in the downstream approval of any OSW project. Rather we reiterate previous well known requests to BOEM to develop measurable criteria for excluding areas from development when risks to the physical and human environment exceed acceptable thresholds and apply those on regional and project-specific bases in all regions. Disappointingly the draft PEIS only evaluates the six OSW leases in the NY Bight excluding the existing leases on the east coast and anticipated addition of Central Atlantic WEAs all which contribute to cumulative effects to many of the same species oceanographic systems and fisheries. The draft PEIS also does not explain how BOEM's ongoing development of fisheries mitigation guidelines will interface with the findings of the final PEIS.	Section 1.2, Table 1-1, *History of BOEM planning and leasing activities in the NY Bight*, summarizes the history of BOEM's planning process and lease sale for the NY Bight, including the 2018 Call for Information and Nominations, the 2021 identification of the WEAs, and the Draft and Final Environmental Assessment (EA) for commercial and research leases. The table also summarizes the public notification and public comment periods that were conducted as part of the process. The analysis and development of the WEA in the NY Bight are summarized in the *New York Bight Area Identification Memorandum Pursuant to 30 CFR 585.211(b),* which is found on BOEM's website: https://www.boem.gov/sites/default/files/documents/renewable-energy/Memorandum%20for%20Area%20ID%20in%20the%20NY%20Bight.pdf. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under BOEM's regulations, and that analysis will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. BOEM assesses the cumulative effects of the NY Bight projects in combination with ongoing and planned reasonably foreseeable activities, which are defined in Section 3.3.1. In addition, BOEM would have the opportunity to consider new information in each individual COP-specific NEPA document about what other activities are reasonably foreseeable at the time. Table 3.6.1-21 provides an RP, COMFIS-5, which recommends that lessees follow the Fisheries Survey Guidelines issued by BOEM with regards to

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		pre-, during- and post-construction fisheries monitoring survey plan design.
BOEM-2024-0001-0469-0002	Purpose of and Need for the Proposed Action The Draft PEIS states that the purpose of the proposed action is to: "identify issues analyze degree of potential impacts and adopt as appropriate AMMM measures This PEIS will reduce redundancies across COP-specific NEPA analyses including very similar affected environments impacts and mitigation measures and will allow for future project-specific NEPA documents to be focused on the project-specific impacts not considered in the PEIS or those impacts that warrant further consideration. The Proposed Action is needed to help BOEM make timely decisions on COPs submitted for the six NY Bight lease areas." [Footnote 5: BUREAU OF OCEAN ENERGY MGMT. NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT at 1-4 1-5 (Jan. 2024).] The agency's main goal in taking this approach clearly appears to be expediting review and approvals of future OSW projects. This is concerning as there are many knowledge gaps regarding the marine life in this region and the potential effect of creating a vast array of OSW installations. [Footnote 6: E.g. BUREAU OF OCEAN ENERGY MGMT. NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT appx. E (Jan. 2024); BUREAU OCEAN ENERGY MGMT. & NAT'L OCEANIC & ATMOSPHERIC ADMIN. BOEM & NOAA FISHERIES NORTH ATLANTIC RIGHT WHALE AND OFFSHORE WIND STRATEGY at 9 (Jan. 2024) (citing Dorrell RM Lloyd CJ Lincoln BJ Rippeth TP Taylor JR Caulfield CP Sharples J Polton JA Scannell BD Greaves DM et al. 2022. Anthropogenic mixing in seasonally stratified shelf seas by offshore wind farm infrastructure. Frontiers in Marine Science. 9:830927. Doi:10.3389/fmars.2022.830927 and Raghukumar K Nelson T Jacox M Chartrand C Fiechter J Chang G Cheung L Roberts J. 2023. Projected cross-shore changes in upwelling induced by offshore wind farm development along the California coast. Communications Earth & Environment. 4(4):116. Doi:10.1038/s43247-023-00780-y).]Sound science takes time; as does planning to determine and assess the impacts and take actions to avoid minimize and/or mitigate accordingly. Doing less puts marine life at grave risk.	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. During the COP-specific NEPA process, BOEM will hold a public comment period at the start of the NEPA process (scoping) and following the release of the Draft NEPA document, whereby members of the public and agencies can provide input to help inform the NEPA process, alternatives, and mitigation measures to identify and minimize environmental effects. Additionally, throughout the NEPA process BOEM works closely with Cooperating Tribal Governments and federal and state agencies to assist with assessing impacts and identifying mitigation measures.

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BOEM-2024-0001-0469-0003	The Draft PEIS assumes the maximum use scenario that projects will use the most impactful range of the project design envelope. However for some factors BOEM predicts that impacts will be "negligible to major "the entire possible range of impacts because the actual impacts will depend on the individual parameters of the project. [Footnote 7: NEW YORK BIGHT DRAFT ENVIRONMENTAL IMPACT STATEMENT supra note 5 at ES-10-13] In addition the Tiering Guidance appendix states that the impact analysis in the PEIS for categories such as marine mammals cannot be used for individual Construction and Operations Plan ("COP") environmental reviews under the National Environmental Policy Act ("NEPA"). [Footnote 8: Id. At appx. C.] Taken together this all calls into question the utility of attempting to analyze such project-dependent impacts on a programmatic scale.	The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. Project-specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater, equal, fewer, or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Refer to Appendix C, *Tiering Guidance*, for specific recommendations by resource topic regarding how the PEIS may be incorporated by reference in the future COP-specific NEPA documents; this appendix also identifies additional analysis that would likely be required as part of the COP-specific NEPA analysis once detailed and site-specific project information is available.
BOEM-2024-0001-0469-0004	In absence of a PEIS avoidance minimization and mitigation ("AMMM") measures would be analyzed in the NEPA reviews of individual projects on a case-by-case basis. BOEM proposes choosing Alternative C adopting mitigation measures on a programmatic level i.e. for all six projects. [Footnote 9: Id. At ES-3]. According to BOEM representatives this would allow the agency to simply "check a box" applying the mitigation measure once they determined the measure applied to the individual project instead of performing an individual analysis on the mitigation measure. However for many affected resources the projected impacts remain constant between Alternative B (deferring adoption of mitigation measures until the individual NEPA review) and Alternative C especially for cumulative impacts. BOEM representatives stated that they would refine the mitigation measures as OSW develops and expressed that they were especially interested in comments on the mitigation measures themselves which COA provides later in Section VI. While COA does not wish to discourage the development and adaptation of AMMM measures it is unacceptable that currently available AMMM measures do not appear to be effective based on these projections.	Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. Project-specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater, equal, fewer, or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Based on public and agency comments on the Draft PEIS, BOEM has revised several AMMM measures, which are described in Appendix G, *Mitigation and Monitoring*.
BOEM-2024-0001-0469-0005	Additionally the Draft PEIS references New York and New Jersey's statutory mandate and executive orders (respectively) requiring a certain amount of wind energy generation by a target year as well as	Section 1.3, *Purpose of and Need for the Proposed Action*, describes the purpose of the Proposed Action, which supports Executive Order 14008 “Tackling the Climate Crisis at Home and

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	the federal government's Executive Order 14008 and the associated goal to generate thirty (30) gigawatts of OSW capacity by 2030. The federal goal was developed by the Departments of Interior, Energy, Commerce, and Transportation but there is no detailed documentation or analysis on how these goals were developed and what environmental technological or economic standards they meet nor any public transparency or review. All these goals are intended to boost renewable energy development but the goals do not go through the same environmental review processes as the individual projects created to meet them.	Abroad" and President Biden administration's goal of 30 GW of offshore wind capacity by 2030. Goals set by the federal government or the states are not federal actions that require NEPA review.
BOEM-2024-0001-0469-0006	In summary the purpose and need statement prioritizes speed over due process and filling scientific knowledge gaps. The programmatic approach is of limited help when so many impacts must be considered at the individual COP review stage and the AMMM measures do not appear to change the overall environmental impacts in many cases. Further the push for OSW development is based on aspirational goals.	Project-specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater, equal, fewer, or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Refer to Appendix C, *Tiering Guidance*, for specific recommendations by resource topic regarding how the PEIS may be incorporated by reference in the future COP-specific NEPA documents; this appendix also identifies additional analysis that would likely be required as part of the COP-specific NEPA analysis once detailed and site-specific project information is available.
BOEM-2024-0001-0470-0004	The amounts of installed capacity and number of Wind Turbine Generators (WTGs) in the planned projects as described in the PEIS are inconsistent and seriously misleading:--On page ES-4 the PEIS states "Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy."--On the same page the PEIS states an estimated 16-18 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022).--On page ES-7 of the PEIS BOEM states that "For the analysis of six NY Bight projects BOEM anticipates development of 1103 WTGs 22 offshore substations (OSSs) 44 offshore export cables totaling 1772 miles (2852 kilometers) and 1582 miles (2546 kilometers) of inter-array cables across the six NY Bight lease areas."---This assertion that the six NY Bight projects would build "up to 1103 WTGS" is repeated on	The estimated power ratio of 3 MW per square kilometer and an estimate of 5.6 to 7 GW for total generating capacity of the NY Bight leases presented in Section 1.3 of the PEIS are derived from the BOEM December 2021 Final Sale Notice for the NY Bight leases. BOEM has added a footnote to this statement in Section 1.3 clarifying the source of this information. The power-generating capacity from the Final Sale Notice is provided for informational purposes and is not used in the analysis of the alternatives. The analysis of the alternatives is based on the parameters of the RPDE described in Section 2.1.2 of Chapter 2. BOEM recognizes that as technology advances and as projects are designed to maximize power output, the actual generation capacity of the NY Bight lease areas could be greater. Refined estimates of the anticipated generation capacity of each project proposed in the NY Bight lease areas will be described in each COP and project-level NEPA analysis.

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	PEIS page 2-16.--On page 3.4.1-8 the PEIS says the NY Bight Projects evaluated in the PEIS would construct an estimated 9922 MW of renewable power from the installation of 713 WTGs citing Table D2-1 in Appendix D.---Table D2-1 indicates only 8822 MW will be installed by the current projects and require 615 WTGs---Table D2-1 further indicates that a further 1103 WTGs are planned but fails to disclose the resulting installed MWs. (Using a ratio analysis of the data provided in Table D2-1 if 615 WTGs will produce 8822 MW of installed capacity then 1103 WTGs would constitute another 15822 MW installed).--The Table in Appendix D appears to conflict with text elsewhere in the PEIS and indicates the total planned buildout of OSW in the NY Bight leases is 26644 MW.	The purpose and need states the PEIS supports state climate goals, but it is not intended to meet state obligations. BOEM's leasing process for offshore wind is independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals. The estimate of 9,922 MW of renewable power in Section 3.4.1.1 (now 9,561 MW due to updates to ongoing and planned offshore wind projects in PEIS Appendix D) is describing ongoing and planned offshore wind in the geographic analysis area for air quality, excluding the NY Bight project. In Table D2-1, the combined number of turbines for all six NY Bight projects (1,103 WTGs) is presented, consistent with the estimates presented in the six-project RPDE in Chapter 2. To avoid speculation, the total generating capacity of the NY Bight leases is not described. The generating capacity of a turbine or a project does not directly relate to impacts; it is rather the physical dimensions of the WTGs and other parameters that relate to environmental impacts.
BOEM-2024-0001-0470-0005	[Bold: II. COMMENTS][Underline: 1. Segmentation:] [Bold: The PEIS violates 38 CFR Section 200.4 by improperly segmenting the Proposed Action from the full complement of OSW projects and installed Wind Turbine Generators (WTGs) needed to meet the dual legal requirements of service load obligations and applicable state mandates for renewable energy.] The purpose of the Proposed Actions is to build and operate OSW facilities that produce "renewable" electricity from sources approved under NY law and NJ Executive Order to meet what is now and re- mains in the future a long-established "service obligation" [Footnote 1: Federal law defines the "service obligation" as a requirement applicable to or the exercise of authority granted to an electric utility under Federal State or local law or under long-term contracts to provide electric service to end-users or to a distribution utility (16 USC Section 824q).] to provide electricity to end-use consumers. Switching the existing generation from fossil fuels and nuclear power to renewables such as offshore wind requires full assessment of the impacts of building out the full complement of OSW facilities that will be needed so a) the public is fully informed of the magnitude of the federal action	The regulations identified in the comment (38 CFR 200.4) do not apply to BOEM or the DOI. The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. BOEM assesses the cumulative effects of each project in combination with ongoing and planned reasonably foreseeable activities, which are defined in Section 3.3.1. The cumulative effects analysis in the PEIS considers ongoing and planned

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	and b) complete and cumulative impacts can be assessed. This "segmenting" of OSW projects is a blatant violation of NEPA and its regulations given the stated purpose of the PEIS is to assess the "potential biological socioeconomic physical and cultural impacts that could result from development activities for six commercial wind energy leases in an area offshore New Jersey and New York known as the New York Bight (NY Bight)" (PEIS page ES-3).	offshore wind activities. This analysis will be reviewed and augmented at the COP specific stage to ensure that each project is considered in the context of reasonably foreseeable activities. In the PEIS, BOEM considers the effects of the addition of the six NY Bight projects to other ongoing and planned projects in accordance with NEPA.
BOEM-2024-0001-0470-0010	[Italics: c) The forecast growth in electricity demand by industry regulators cannot be met by the segmented OSW Projects described in the PEIS]The planned 8822/9922 MW construction under the Proposed Action is well below the 20 MW total needed for the initial compliance with NYS CLCPA and the NJ EO and woefully below what NYISO growth forecasts indicate will be needed for full NYS compliance alone. The PEIS borders on fraudulent in its failure to fully disclose and assess the full effects of building out and operating the total number of WTGs needed to "meet" renewable goals and mandates given the realities of demand growth and service obligation; the full buildout will generate compounding and cumulative damage to irreplaceable maritime assets from construction and operation of both WTGs and attendant transmission facilities that are effectively ignored. Nor does the PEIS disclose and analyze the amount of non-intermittent electric generation (nuclear hydro fossil etc) along with storage/battery facilities that will be needed to ensure reliable electric supplies during the 60% downtime experienced by OSW generation or storage facilities.	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. The purpose and need further states that the PEIS supports federal goals of 30 GW and state goals, but it is not intended to meet state obligations. BOEM's leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals. The PEIS does disclose the cumulative effects of buildout of other ongoing and planned offshore wind projects on the OCS within the geographic area of analysis for each resource. Regarding other sources of energy, the PEIS is analyzing wind development in six offshore wind lease areas, and the analysis of other sources of energy or battery storage is outside the scope of this PEIS.
BOEM-2024-0001-0470-0011	-[Italics: New York]Page 3.4.1-6 of the PEIS notes that the New York State Energy Research and Development Agency (NY- SERDA) led the development of the New York State Offshore Wind Master Plan is leading the coordination of offshore wind opportunities in New York State and is supporting the development of 9000 MW of offshore wind energy by 2035.[Table 4: NYSERDA Projected Generation and Fuel Type]NYSERDA Generation Model: Upstate 2030; Demand Load (Gigawatt Hours/ GWh): 51223; Percentage Renewable: 70%; Percentage Offshore Wind: 0%NYSERDA Generation Model: Downstate 2030; Demand Load (Gigawatt Hours/ GWh): 100455; Percentage Renewable: 70%; Percentage Offshore Wind:	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. The purpose and need further states that the PEIS supports federal goals of 30 GW and state goals, but it is not intended to meet state obligations. BOEM's leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals. Additionally, BOEM

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	24%NYSERDA Generation Model: Upstate 2040; Demand Load (Gigawatt Hours/ GWh): 74905; Percentage Renewable: 75%; Percentage Offshore Wind: 0%NYSERDA Generation Model: Downstate 2040; Demand Load (Gigawatt Hours/ GWh): 132601; Percentage Renewable: 90%; Percentage Offshore Wind: 33%[Table End][Bold: Source: NYSERDA.NY.Gov]On its [Underline: "Story of Our Grid"] page NYSERDA divides the NYCA into Up- and Downstate regions to illustrate how various fuel types will be used to deliver the NYISO-measured load demand. NYSERDA calculations of future demand levels (using numbers similar but not equal to those of the NYISO) and planned renewable contributions for the NYS Grid are summarized in Table 4. [Footnote 3: The total demand included in the NYSERDA calculations for 2030 are lower and the 2040 estimates are higher than the forecasts in the NYISO Gold Book provided in Table 2. NYSERDA does not provide estimates to 2053] [Footnote 4: New York City demand is currently about 55000 GWh a little over half of the forecast 2030 Downstate demand for ~100000 GWh.] NYSERDA's Upstate/Downstate demand ratios run about one-third/two-thirds of the total load demand in the NYCA. Applying those ratios to the 2053 NYISO forecast downstate demand will approximate 155113 GWh. The "Story of Our Grid" webpage states that "Downstate load is completely met with zero emissions generation in 2040" a claim that is based on 33% of load being met with offshore wind. Applying this 33% requirement to the 2053 demand forecast means that more than [Bold: 50000 GWh] of OSW generation is necessary meet the CPCLA mandates in 2053. [Footnote 5: Calculations of GWh from OSW WTGs herein use a capacity factor of 40% a three-year average of global capacity factors for 2020 to 2022 reported in 2024 by Statista.] Sourcing the 2040 downstate demand with 33% OSW production (as planned by NYSERDA) would require WTG capacity to make [Bold: 43758 GWh.] As noted above were the projects to actually total 9922 MW from 713 WTGs (vice 8822 MW from 613 WTGs) electric generation could approach [Bold: 35000 GWh of electricity.] Assuming NY gets 50% of the output from the set (segment) of projects analyzed in the PEIS [Bold: the 2053 demand shortfall would be more than 30000 GWh.] Looked at another way meeting the 2053 downstate demand of over	can only act as authorized under OCSLA, and it has no control over how much energy/electricity is needed or what other types of energy sources are used. Each individual COP submitted by a developer to BOEM will be analyzed separately as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area. BOEM assesses the cumulative effects of each project in combination with ongoing and planned reasonably foreseeable activities, which are defined in Section 3.3.1. The cumulative effects analysis in the PEIS considers ongoing and planned offshore wind activities. This analysis will be reviewed and augmented at the COP-specific stage to ensure that each project is considered in the context of reasonably foreseeable activities. In the PEIS, BOEM considers the effects of the addition of the six NY Bight projects to other ongoing and planned projects in accordance with NEPA.

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	155000 GWh with 33% OSW [Bold: (50000 GWh)] requires about [Bold: 15000 MW of installed OSW capacity.] This means NYS alone requires nearly half of all the off-shore wind in the Administration's Program to actually meet its CPCLA obligations. The PEIS completely fails to disclose the reasonably foreseeable future actions needed to secure the actual MW/WTG buildout needed to produce the 50000 GWh to meet the NYS mandate alone.[Table Start: Eastern Seaboard Homes]Eastern Seaboard States: ME; "HOMES" (in millions): 0.57Eastern Seaboard States: MA; "HOMES" (in millions): 2.71Eastern Seaboard States: RI; "HOMES" (in millions): 0.42Eastern Seaboard States: CT; "HOMES" (in millions): 1.39Eastern Seaboard States: NY; "HOMES" (in millions): 7.53Eastern Seaboard States: NJ; "HOMES" (in millions): 3.39Eastern Seaboard States: PA; "HOMES" (in millions): 5.14Eastern Seaboard States: DE; "HOMES" (in millions): 0.45Eastern Seaboard States: MD; "HOMES" (in millions): 2.29Eastern Seaboard States: VA; "HOMES" (in millions): 3.24Eastern Seaboard States: NC; "HOMES" (in millions): 4.01Eastern Seaboard States: SC; "HOMES" (in millions): 1.97Eastern Seaboard States: GA; "HOMES" (in millions): 3.88Eastern Seaboard States: FL; "HOMES" (in millions): 8.15Eastern Seaboard States: Total; "HOMES" (in millions): 45.14[Table End][Bold: Source: US Census Bureau] For purposes of grid stability and reliability as well as delivering forecast demand requirements it is important to note that the Downstate/NYC demand for 50000 GWh includes vast municipal enterprise systems such as subways wastewater treatment plants hospitals emergency services (police fire emergency medical) street and traffic lights all requiring 24/7 electricity supply in copious amounts for all residents but especially underserved and environ- mental justice populations. Describing actual turbine electricity production in euphemistic misleading comparisons about powering "X Million Homes" is highly deceptive. As Table 5 shows the Eastern Seaboard has over 45 million "homes." Breaking down the deceptive tagline about the vaunted Atlantic OSW program powering "10 Million Homes" if the planned 30 GW installed can serve 10 million homes 45 million homes will require 135 GW installed. The US Department of Energy typically cites 412 offshore WTGs as the requirement per gigawatt meaning that powering [Bold: all] the East coast homes (and [Bold:	

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	just] the homes) with the needed 135 gigawatts of wind at 412 turbines per gigawatt puts over 55000 turbines in the irreplaceable maritime system of the Atlantic a far cry for the 600-700 turbine segment analyzed in the PEIS.	
BOEM-2024-0001-0470-0012	[Italics: New Jersey]Data on load growth in New Jersey is not as clear due to its inclusion in the multi-state Pennsylvania/Jersey/Maryland ISO (PJM). The [Underline: 2024 PJM Load Forecast Report] states that the total annual energy use throughout the PJM footprint is expected to increase nearly 40% by 2039 from the current 813328 to 1021955 GWh. Of that about 30000 GWh of additional demand is identified as coming from the four NJ utility zones summarized in Table 6. [Footnote 6: The total NJ load growth was calculated by subtracting the 2024 load forecast amount from the 2039 load forecast amount for the four NJ service zones listed in Table E-1 ANNUAL NET ENERGY (GWh) AND GROWTH RATES FOR EACH PJM MID- ATLANTIC ZONE AND GEOGRAPHIC REGION 2024 – 2034 summarized on pages 71-72 of the 2024 PJM Load Forecast Report linked above.][Table 6: NJ Forecast Load Increases]NJ Utility Zone: Atlantic Electric (AE); Load increase 2024-2039 (GWh): 2556NJ Utility Zone: Jersey Central Power & Light (JCPL); Load increase 2024-2039 (GWh): 11380NJ Utility Zone: Public Service Electric & Gas (PS); Load increase 2024-2039 (GWh): 15155NJ Utility Zone: Rockland Electric (East) (RECO); Load increase 2024-2039 (GWh): 341NJ Utility Zone: Total; Load increase 2024-2039 (GWh): 29432[Table End][Source: 2024 PJM Load Forecast Report]According to the [underline: U.S. Department of Energy's Energy Information Agency (EIA)] New Jersey plants of all types produced 65061 GWh of electricity in 2022 of which 33394 GWh came from natural gas production. [Footnote 7: US EIA New Jersey Electricity Profile 2022. New Jersey currently has 26 natural gas-fired power plants.] The entire mandated 11000 MW of OSW installed capacity (only a fraction of which will come from the Proposed Action being evaluated) could only produce about 39000 GWh. This means that full buildout of the NJ EO goal (one-third of the total Atlantic OSW planned by the Biden Administration) might produce enough electricity to replace natural gas plants or increase production to meet load growth from data centers and electric vehicles [Bold: but not both.] It is hard to conceive how the	Please see response to comment BOEM-2024-0001-0470-0011.

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	purpose of the action to make the New Jersey grid emission-free is satisfied if only the disclosed segment of OSW wind construction is used. These arithmetic impossibilities become even more glaring and problematic when considering the 2023 acceleration of clean energy goals in [Underline: NJ Executive Order 315]. Previously the 2019 EMP required 100 percent clean energy by 2050; the new EO 315 deadline is 2035. Notably the NJ State Senate recently woke suddenly from a green-dream when a bill authorizing a public referendum on amending the state's Constitution to ban construction of new power plants that burn natural gas or other fossil fuels was amended to allow the construction of such plants if they are to be primarily used as emergency backup power sources. The carve-out manages the damaging grid reliability risks exposed when Superstorm Sandy knocked out power in 2012 causing nearly a billion gallons of untreated sewage to flow into area waterways because sewage plants lacked accessible backup generation. The New Jersey arithmetic again demonstrates that the realities of the service obligation and actual OSW electricity production confirm these projects are but a fractional segmented portion of the actions needed to meet the overall energy production goals not just renewable standards.	
BOEM-2024-0001-0470-0013	[Italics: c) The final EIS analysis must analyze the fully aggregated (not segmented) complement of operational generation assets and storage capacity needed to reliably satisfy the identified electricity demand (including growth) while combatting the climate crisis through deployment of clean energy technologies and infrastructure.]The PEIS must redefine the Proposed Action as including construction and operation of the full complement of WTGs and storage facilities needed to meet both the known load requirements and renewable portfolio standards simultaneously. Without properly defined and unsegmented actions any evaluation or adoption of so-called programmatic avoidance minimization mitigation and monitoring (AMMM) measures remains inaccurate insufficient misleading and violative of the spirit and letter of the National Environmental Policy Act and its attendant regulations.	Please see response to comment BOEM-2024-0001-0470-0011.
BOEM-2024-0001-0470-	[Bold: III. SUMMARY]-In spite of high populations and significant population density East Coast states almost universally achieve the	Please see response to comment BOEM-2024-0001-0470-0011.

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0020 and BOEM-2024-0001-0470-0021	lowest per capita carbon emissions in the country based on their historic underwriting of clean energy and transport systems. --Inland states with whom eastern states are competing for new manufacturing facilities and other economic development opportunities still make significant portions of their electricity from coal and natural gas. This keeps electricity prices low and attracts businesses that use electricity as operational fuel at the same time greenhouse gas emission levels remain high. --Forcing eastern states to shut down clean capacity and/or prematurely retire non-coal electricity production facilities in favor of massive expenditures for OSW facilities that are merely presumed to be "environmentally preferable" (all evidence to the contrary) further increases already high east coast electricity prices and exacerbates [Underline: competitive advantage already accruing to fossil-electric generating states.]	BOEM has authority under OCSLA to authorize renewable energy activities on the OCS and evaluates projects as proposed by developers under its regulations. Electricity rates are not within the scope of the PEIS and are part of agreements with the state and developer.
BOEM-2024-0001-0470-0022 and BOEM-2024-0001-0470-0023	For an industry as damaging dangerous and risky as OSW whether by design or function BOEM's system of programmatic EISs coupled with tiered analysis for subsequent issuance of various construction permits and approvals woefully fails to meet the most basic principles and requirements of the National Environmental Policy Act and this PEIS is no different. --Analyses separated into geographically disperse lease-areas inevitably suffer from improper segmentation fail to assess cumulative impacts and ignore the macro-socioeconomic impacts that will affect businesses and populations across large areas because these projects involve electricity as fundamental to survival in today's times as air and water.	Please see response to comment BOEM-2024-0001-0470-0011. The PEIS is a regional analysis and not an analysis on specific individual lease areas.
BOEM-2024-0001-0470-0024	BOEM cannot willfully ignore the realities and plain arithmetic of electricity demand growth when assessing the viability and effects of eliminating electric generation plants that can meet critical survival needs sanitation transportation communication safety education food security inter alia in favor of expensive unreliable and damaging WTGs that cannot do the job without multiple layers of storage backup along with additive transmission facilities. These sine qua non co-components bring compounding as well as cumulative negative effects to the areas where they must be built and operated.	Please see response to comment BOEM-2024-0001-0470-0011. Offshore wind would likely be in addition to other energy sources. Wind energy would displace fossil fuel energy to the extent that it is offered to the grid at a lower price than the bids from fossil-fueled energy sources.

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	--By 2053 downstate New York electricity demand growth is forecast to be over 155000 GWh (two-thirds of 253020 GWh); producing 33% of that load with OSW (50000 GWh) requires the output of about 15000 MW of installed OSW capacity far more than the current acknowledged projects could deliver to the NY Grid. --By 2039 New Jersey is forecast to add 29432 GWh to its demand load and also plans to replace 33394 GWh of current electricity produced by natural gas plants both with OSW. Satisfying this actual requirement for 62826 GWh of clean/renewable electricity for NJ's portion of the PJM grid with OSW would necessitate more than the planned 11 GW installed capacity. --Electricity demand in these two states alone have an estimated requirement for about 26 GW of installed OSW to meet service obligations almost 87% of the entire 30 GW Atlantic Offshore Wind Program planned by the Biden Administration. --To the extent the current Proposed Actions build less than 26000 GW installed OSW capacity in the NY Bight to meet concurrent demand growth and portfolio standards additional undisclosed energy storage facilities will also be required to reliably assure service obligation generation levels. The size location and full suite of impacts from the construction and operation of such storage facilities along with all necessary transmission and distribution infrastructure must be included in any and all environmental impact analysis to prevent improper segmentation and assure full cumulative impact analysis.	
BOEM-2024-0001-0470-0025	No amount of mitigation can be accurately assessed or planned in the absence of accurate and fully disclosed impacts and effects from building and operating the full complement of OSW WTGs and attendant storage/transmission facilities needed to meet the knowable and known amounts of electricity required to sustain the populations and assets of the affected states. The environmentally preferable option for greening the nation's electricity portfolio does not involve the green eastern seaboard states. Real decarbonization will come from discontinuing the 675000 GWh of electricity still produced with coal plants in the US few if any of which are in Atlantic Seaboard states.	Please see response to comment BOEM-2024-0001-0470-0011.

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	--No agency of federal state or local government should use public funds to subsidize or under- write premature retirement and/or displacement of existing non-coal electricity production assets until existing coal plants are first replaced by the ratepayers who benefit from them (especially those in states with the highest GHG outputs per capita).	
BOEM-2024-0001-0474-0004	Among other reasons the action is Arbitrary because the BOEM administrative process favors the private interests of offshore wind developers to the detriment of the citizen stakeholders and the general public. Among other reasons the action is Arbitrary because the energy goals established in Executive Orders and Presidential Proclamations are not within the authority of the Executive Branch and do not have the force of law as the authority belongs in the legislative branch of government. Among other reasons the action is Arbitrary because the energy goals established by Executive Orders and presidential proclamations usurp personal freedoms. Among other reasons the action is Arbitrary because fees paid by the leaseholders and other funds collected from leaseholders and offshore wind developers are illegally and improperly deposited to the United States Treasury without dedication to the specific purpose and recognition of the cost of harm and remediation to the ocean. Among other reasons the action is Arbitrary because the leasehold interests restrict and interfere with the right to travel of all citizens and all members of the public.	Please see response to comment BOEM-2024-0001-0470-0011. BOEM's responsibility under the Energy Policy Act of 2005 is to issue renewable energy leases, easements, and ROWs for activities on the OCS (see PEIS Section 1.4, *Regulatory Overview*).
BOEM-2024-0001-0528c	Beginning with offshore wind, transforming the ocean into a giant power plant. This despite the fact that the industry is in economic and technological turmoil, as evidenced by the abandonment of many projects by Ørsted and others, as well as technological challenges and failures, such as the inadequate grid to even accept the energy generated.	BOEM's responsibility under the Energy Policy Act of 2005 is to issue renewable energy leases, easements, and ROWs for activities on the OCS. The purpose of the PEIS is to identify issues and analyze potential impacts for the six NY Bight lease areas. Grid reliability is outside of BOEM's regulatory authority and the scope of the PEIS. The grid operator is responsible for managing the reliability of the grid. While offshore wind in the NY Bight would provide a new source of energy to the states of New York and New Jersey, other sources of energy would still be generated.
BOEM-2024-0001-0528c	And yet this PEIS seeks to streamline and expedite the issuance of these industrial scale offshore wind projects on these 6 lease areas which impact over nearly a half 1 million acres. To be clear, Clean Ocean action is not opposed to the idea of offshore wind, Clean	Thank you for your comment. The purpose of the Proposed Action is to describe issues, analyze degree of potential impacts, and identify, as appropriate, AMMM measures. BOEM is preparing this Final PEIS because of the close

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	Ocean Action opposes this reckless scope, scale and speed currently underway due to its lack of robust, independent science, transparency, good governance, and due diligence. Our ocean deserves better. A fair pilot project and independent cost benefit analysis, and also public transparency.	proximity of the six NY Bight lease area, their similar level of development due to the leases being awarded from the same auction, the close timing of the anticipated COP submissions, and the high, near-term demand from the states of New York and New Jersey for electricity generated by offshore wind. This PEIS will reduce redundancies across COP-specific NEPA analyses, including very similar affected environments, impacts, and mitigation measures, and it will allow for future project-specific NEPA documents to be focused on the project-specific impacts not considered in the PEIS or those impacts that warrant further consideration. BOEM will still conduct project-specific NEPA analysis of the COP for each lease area, and it will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP NEPA stage. Further, BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project-specific COPs and EISs.
BOEM-2024-0001-0528f	Despite a growing demand for energy, the scale, scope, and speed of these offshore wind projects has continued to be a concern, but with this PES, it seems, the intent is to move even faster.	Thank you for your comment. The purpose of the Proposed Action is to describe issues, analyze degree of potential impacts, and identify, as appropriate, AMMM measures. BOEM is preparing this Final PEIS because of the close proximity of the six NY Bight lease areas, their similar level of development due to the leases being awarded from the same auction, the close timing of the anticipated COP submissions, and the high, near-term demand from the states of New York and New Jersey for electricity generated by offshore wind. This PEIS will reduce redundancies across COP-specific NEPA analyses, including very similar affected environments, impacts, and mitigation measures, and it will allow for future project-specific NEPA documents to be focused on the project-specific impacts not considered in the PEIS or those impacts that warrant further

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		consideration. The expectation is that the analysis at the COP NEPA stage can be more streamlined and efficient. BOEM will still conduct project-specific NEPA analysis of the COP for each lease area, and it will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP NEPA stage.
BOEM-2024-0001-0528w	The environmental impacts of the individual projects will vary greatly, depending on which design elements they choose. Yet the PEIS would allow them to use, depending on the resource, the same characterization of the affected environment and or qualitative impacts estimated in the PEIS for the environmental reviews of the individual projects. This will expedite the environmental review process and threaten the quality of the analysis.	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.
BOEM-2024-0001-0529k	Instead, the government has set its sights primarily on fast tracking, massive ocean industrialization, transforming the ocean into a giant offshore power plant. Despite the fact that the industry is in economic and technological turmoil.	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.
BOEM-2024-0001-0529o	The scale, scope and speed of these offshore wind projects has always been a concern, but with this PEIS it seems the intent is to move even faster.	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.
BOEM-2024-0001-0529t	The stated purpose and need for this PEIS is to consider the combined impacts of these projects in order to streamline offshore wind development in response to President Biden's executive order calling for a certain amount of offshore wind energy to be to be developed by 2040, it's 11 gigawatts. This presupposes that offshore wind projects must be developed in this area which runs counter to the purpose of the National Environmental, Environmental Policy Act, which is to analyze the effects of projects before deciding to build them. The purpose in this section also incorrectly claims that BOEM can predict the environmental impacts of projects with wide ranges of design elements in a helpful way. Because choosing different foundations, different numbers of turbines or different types of substations, just to name a few examples, will have very different environmental impacts depending on which part of the	Please see response to comment BOEM-2024-0001-0528f for information on the purpose of this PEIS and subsequent COP NEPA reviews.

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	range a developer chooses. That is likely why the range of impacts for the different factors can be as high as negligible to major. Yet the PEIS would allow BOEM to use, depending on the factor, the same characterization of the affected environment and the same qualitative impacts estimated in the PEIS and the environmental reviews of the individual projects. This is what we mean when we say that speeding up the environmental review process comes at the expense of the quality of the analysis.	
BOEM-2024-0001-0310f	A smaller pilot trial project would be more prudent and give all of us a chance to assess its environmental safety and energy generating efficiency.	BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project-specific COPs and EISs.
BOEM-2024-0001-0310i	But one of the things I think that is not included in a lot of the BOEM documents is the fact that this industry is not going to produce enough energy for the big cities. The wind turbines does not produce enough energy for the MTA in New York City, for the police, for the Homeland Security, for the hospitals. Wind blows 38 percent of the time. What are you supposed to do for the rest of the time? You have 24/7 backup with the industry that they are saying, you know, you know, reducing. They're actually increasing the oil industry and gas, because we need all this backup because this industry cannot do the job.	Thank you for your comment. BOEM expects that offshore wind development in the NY Bight lease areas would lead to reductions in fossil fuel usage in the U.S. However, the wind turbines would not be a sole source of electricity to the electrical grid; other sources of electric generation—including both renewables and fossil fuels—are connected to the electrical grid and would continue to supply electricity in the event that the wind turbines are shut down for any reason.
BOEM-2024-0001-0310l	The problem with offshore windmills is they're expensive. According to the Energy Information Administration, offshore wind is the most expensive energy resource in our repertoire based on the level cost of energy. The 2002 estimate for offshore wind absent of any government subsidies is $136 per megawatt of electricity. How are we the people of New York and New Jersey going to afford our electric bills? Thank you.	Thank you for your comment. The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state's offshore wind procurement laws and regulations.
BOEM-2024-0001-0310m	There's one other thing. I actually wanted the audience to know, but I want to BOEM to know too. This isn't your fault. You're given the task of working with the prospect of offshore wind. And so ahead of	Thank you for your comment. The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies,

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	that somebody decided to do offshore wind, and the cost of the project and its benefits have been shrouded in mystery and the mystery is starting to clear and the curtain is starting to get drawn back and people are starting to understand the cost figures per person, per home. When we're told and you allow a certain wind farm or a set of wind farms to be built, we're told how many homes that would serve with electricity. We're not told what it costs per home to provide that. 'Cause that cost is on our backs. It shows up in our taxes and in our electric rates eventually. We have to pay all that back to the wind builders. We have to give them their profit they're guaranteed. So I will leave it at this. You can talk to me in the back if you're interested, but what it's showing is that it costs so much money per home that this would serve that for a tiny fraction, that's the cost to build, maintain the whole lifespan and if we add to that also the losses that we know that the seashores will come to, which includes the fisheries, it includes property value losses, the loss to the shore businesses. When you add all that up divided by the number of homes that that's supposed to provide electricity for, it's such a huge number that you could easily come up with alternatives.	subject to each state's offshore wind procurement laws and regulations.
BOEM-2024-0001-0310p	I have been involved with many of the anti-wind and pro whale groups in the area, I have not found one fact that can support that there's anything good about these offshore wind turbines going in. Not one. If anybody knows of one, please educate me because I have read environmental impact studies and one of the main things that I would like to request from BOEM is to complete your mission statement. Your mission is to environmentally and economically manage our ocean, and by putting in these wind turbines and rushing them through without, you know, without the studies on how it's affecting the marine life and the ocean and the economy, is just irresponsible. You're not meeting your mission statement. So, BOEM, I would like you to meet your mission statement and be environmentally and economically prudent with our ocean. We've only got one. If we ruin it this is going to be the worst environmental	BOEM's Environmental Studies Program develops, funds, and manages rigorous scientific research specifically to establish information needed for assessing and managing environmental impacts of energy and mineral development on the human, marine, and coastal environments. For more information on this program, please visit https://www.boem.gov/environment/how-we-do-research. Further, BOEM's Office of Renewable Energy Programs depends on science to meet its responsibilities under environmental laws, regulations, and standards. As such, BOEM funds and manages scientific research to inform its decision-making processes for renewable energy projects on the OCS. For more information on Office of Renewable Energy Programs, please visit

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	disaster in our lifetime, you know, worse than the polar icecaps and the dinosaurs missing and all that stuff. We cannot get clean water back.	https://www.boem.gov/environment/environmental-studies/renewable-energy-research.

P.5.3 Air Quality and Greenhouse Gases

Table P.5-3. Responses to Comments on Air Quality and Greenhouse Gases

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BOEM-2024-0001-0436-0004	Also potential development of the leaseholds would assist with meeting several state mandates for renewable energy. New Jersey's goal of 11 GW of offshore wind energy generation by 2040 is outlined in New Jersey Executive Order No. 307 issued on September 21 2022. New York's requirement of 9.0 GW of offshore wind energy generation by 2035 is outlined in the Climate Leadership and Community Protection Act signed into law on July 18 2019. Additionally an estimated 1618 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022). Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy.	BOEM agrees that development of offshore wind energy projects would help meet state mandates for renewable energy.
BOEM-2024-0001-0093-0001	I would like to be on record as in favor of the Offshore wind projects in the New York bight. As Chair of the Franklin Township Environmental Commission we are working too minimize fossil fuel use. I believe that Off Shore wind will help in fight against Global warming.	BOEM agrees that development of offshore wind energy projects (to the extent they displace fossil fuels) would help reduce GHG emissions that contribute to climate change.
BOEM-2024-0001-0171-0001	[Underline: Climate & Environment]-As we know all too well the climate crisis poses an imminent threat to coastal communities and states across the entire Northeast. We've continued to experience inland flooding sea level rise severe rain historic snowfalls devastating hurricanes and other extreme weather events and as the climate crisis worsens so will the weather.-To achieve the necessary carbon emission reductions to protect our communities from the	BOEM agrees that development of offshore wind energy projects (to the extent they displace fossil fuels) would help reduce GHG emissions that contribute to climate change.

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	climate crisis we need a major transition in our energy sector now. The only way to protect and sustain our communities and our environment is the safe and responsible transition to 100 percent clean energy and the development of clean energy sources like offshore wind.-Wind energy is clean energy. Unlike energy from sources like coal or methane gas wind energy does not require burning fossil fuels and does not release harmful climate-destabilizing pollution.-By cutting our fossil fuel reliance offshore wind will help alleviate the impacts of climate change statewide. Our communities have already faced the impacts of inland flooding severe rain and weather events. This can go on no more.	
BOEM-2024-0001-0273-0001	Off-shore wind energy is a vital source for low emission energy and the health of our planet. Please make haste to build healthy off-shore wind turbines now.	BOEM agrees that development of offshore wind energy projects (to the extent they displace fossil fuels) would help reduce air pollutant emissions and reduce GHG emissions that contribute to climate change.
IsBOEM-2024-0001-0284-0001	Offshore wind is advertised as "green" or "clean" energy. In my opinion OSW provides no positive impact on the environment and is neither green or clean. According to Boem "Overall it is anticipated that there would be no collective impact on global warming as a result of OSW projects including the Proposed Action alone....". It is my understanding that OSW turbines may actually increase ocean temperatures. I have seen photos of wind turbines with oil lubricant and Sulfur Hexafluoride (SF6) oozing out of them. This leakage can potentially pollute our oceans.	Final PEIS Section 3.4.1.4 discusses the potential impact of the project alternatives on GHG emissions that contribute to climate change. Final PEIS Section 3.4.1.4.3 and Appendix B Section B.1.4 discuss potential impacts of WTGs on ocean temperatures. Final PEIS Sections 3.4.1.3.2 and 3.4.1.4.1 discuss the potential for chemical spills. SF_6 is a colorless gas. A leak of SF_6 would be addressed by repair of the associated switchgear. Applicants would be required, through its OCS air permit, to have leak detection and repair procedures in place prior to operation of WTGs.
BOEM-2024-0001-0284-0003	Offshore wind turbines are more susceptible to extreme weather. Do we know what impact a Category 3 or 4 or a northeaster will have on the stability of these wind turbines? Perhaps that should be studied before committing to hundreds of wind turbines off our shores. I am asking for more research to be done before committing our coastal communities to this inefficient unclean and environmentally unfriendly energy option.	Final PEIS Section 2.3 discusses design features of WTGs to accommodate extreme weather including hurricanes.
BOEM-2024-0001-0313-0028	3.4.1-10 Affected Environment and Environmental Consequences. Offshore wind energy development could help reduce emissions from onshore energy sources potentially improving regional air	The assumptions and calculations underlying the projections commented on are provided in the studies referenced by the commenter.

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	quality and reducing GHGs. Millstein et al. (2018) estimated that between 2007 and 2015 wind power in the US avoided as much as 127698000 metric tons (MT) of CO2 per year 147000 MT of SO2 per year 93000 MT of NOX per year and 9000 MT of PM2.5 per year. A study by the U.S. Department of Energy (USDOE) estimated emissions for a future scenario with wind energy supplying 10 percent of total U.S. electricity demand by 2020 20 percent by 2030 and 35 percent by 2050. The study estimated cumulative emissions reductions from 2013 to 2050 of 2.6 million MT of SO2 4.7 million MT of NOX and 0.5 million MT of PM2.5 (USDOE 2015). Similarly the study scenario was estimated to reduce GHG emissions in the electric sector by 130 million MT of CO2 equivalent (CO2e) in 2020 380 million MT CO2e in 2030 and 510 million MT CO2e in 2050 (USDOE 2015). An analysis by Barthelmie and Pryor (2021) calculated that depending on global trends in GHG emissions and the amount of wind energy expansion development of wind energy could reduce predicted increases in global surface temperature by 0.51.4 degrees Fahrenheit (F) (0.30.8 degrees Celsius [C]) by 2100." Comment Projections to arrive at these statistics and the assumptions and calculations should be substantiated as it is unclear whether factors including construction emissions GHGs associated with manufacturing of the WTGs and all structures is included the emissions from decommissioning and disposal nor does it include the fact that the lifespan of these turbines is approximately 30 years; by 2050 wind turbines in place and presumably used in these calculations will have to be retired so the net impacts may be misleading. It is also a common concern how local impacts and benefits will be felt by the residents these regional and global trends should be contextualized for this project. Is there any impact to ozone which is a concern on long island in the summer months? These projections also appear to have a set of assumptions and offsets for displacing the use of fossil fuels not the net increase assuming these alternative energy methods are an additional energy source and not a substitute. 3.4.1-10 Affected Environment and Environmental Consequences. The section on accidental releases states "Ongoing and planned	Estimates of construction emissions are presented in Final PEIS Section 3.4.1.4.1. Decommissioning emissions were not quantified. As stated in Final PEIS Section 3.4.1.4.1, emissions from manufacturing are not included in the analysis. However, life cycle considerations are discussed in Section 3.4.1.4.1. As indicated in Section 3.4.1.4.1, although wind energy has higher upstream emissions than many other generation methods, its life-cycle GHG emissions are orders of magnitude lower than from other generation methods. Wind energy development (to the extent that it displaces fossil fuel energy) is expected to reduce emissions of NOx and VOC from power plants, which could lead to reduced formation of ozone (O_3) that could affect Long Island. Wind energy would displace fossil fuel energy to the extent that it is offered to the grid at a lower price than the bids from fossil-fueled energy sources. BOEM expects that wind energy would be substituted for and not add to energy from fossil-fueled energy sources. Final PEIS Sections 3.4.1.3.2 and 3.4.1.4.1 discuss the potential for air quality impacts from accidental chemical spills.

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	offshore wind activities could release air toxics or HAPs because of accidental chemical spills within the air quality geographic analysis area.	
BOEM-2024-0001-0313-0031	Section 3.4.1.5.4 Conclusions" Impacts of Alternative C. As with Alternative B development of the NY Bight projects with application of AMMM measures under Alternative C would result in a net decrease in overall emissions over the region compared to the emissions from traditional fossil-fuel power plants. Impact ratings under Alternative C are the same as expected with Alternative B; however the amount of emissions could be less with Alternative C because of the emission reductions achieved by implementation of AMMM measures."	As discussed in Section 3.4.1.5.4, impacts under Alternative C are expected to be less than under Alternative B.
BOEM-2024-0001-0313-0032	General Comments about the section on Air Quality There are concerns regarding the utilization of sulfur hexafluoride as it appears that the technology is either not available and there is no mandate that alternatives be utilized. All mitigation measures identified above are presented with the qualifier "if/as feasible" with no discussion about how this would be implemented. There should be additional discussion regarding compliance and consistency with NYSDEC documents recently released " As part of DEC's ongoing implementation of the Climate Leadership and Community Protection Act (Climate Act) on Dec. 28 2023 DEC filed draft regulations to reduce emissions of two potent greenhouse gases hydrofluorocarbons (HFCs) and sulfur hexafluoride (SF6). HFCs are extremely potent greenhouse gases (GHGs) often used in refrigeration and cooling that have hundreds to thousands of times higher global warming potential than natural refrigerants. As recommended by the Climate Action Council in the Scoping Plan DEC filed proposed amendments to 6 NYCRR Part 494 to further reduce greenhouse gas emissions from refrigerants foams and aerosol propellants. SF6 is the most potent greenhouse gas and in New York State is used in electric power transmission and distribution equipment. As also recommended by the Scoping Plan DEC also filed a new draft regulation 6 NYCRR Part 495 which includes among other requirements a program to phase down the use of SF6 in gas-insulated equipment (GIE) used by the electricity sector." (source: NYSDEC Climate Action Highlights February 2024)	The proposed regulation 6 New York Codes, Rules and Regulations (NYCRR) Part 495, Sulfur Hexafluoride Standards and Reporting, would phase out the use of SF_6 in gas-insulated equipment beginning in 2026. BOEM is recommending RP AQ-1, which would encourage lessees to use a substitute insulator gas rather than SF_6 in the switchgear and transmission systems, if feasible. Final PEIS Section 3.4.1.5.1 discusses mitigation measures. The Final PEIS does not quantify emissions from construction vehicle traffic. However, vehicle traffic would contribute only a small proportion of total project emissions. As stated in Final PEIS Section 3.4.1.4.1, emissions from manufacturing are not included in the analysis. However, lifecycle considerations are discussed in Section 3.4.1.4.1. As indicated in Section 3.4.1.4.1, although wind energy has higher upstream emissions than many other generation methods, its lifecycle GHG emissions are orders of magnitude lower than from other generation methods. The Final PEIS does not quantify emissions from stationary sources, vehicles, production of energy used on the project site or by vehicles, and waste disposal. However, these sources are expected to contribute only a small proportion of total project emissions.

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	It does not appear that the cumulative air quality impacts from construction vehicle traffic of personnel to job sites is included in the impact analysis nor is the air quality impacts of manufacturing and mining of raw materials to produce the wind turbines the associated infrastructure and other materials integral to the proposed action. It stands to reason that this is part of the overall emissions calculation that would not be emitted if not for the creation of this proposed action and as such should be part of the calculation and net impact analysis. It should be noted even the NYSDEC Policy document recommends analysis of direct and indirect emissions when evaluating the impacts of greenhouses gasses "When GHG emissions are considered in an EIS total annual emissions should be presented as short tons of carbon dioxide or for other types of GHGs as both short tons and as equivalent to short tons of CO2 using the most up-to-date global warming potential factors as determined by the Intergovernmental Panel on Climate Change (IPCC) and published in the most recent Assessment Report on Climate Change. In cases when GHGs are analyzed in an EIS both direct and indirect GHG emissions should be assessed. Each of these categories includes both stationary and mobile sources. Direct GHG emissions will include both stack and fugitive emissions from combustion processes or industrial processes conducted on-site and from fleet vehicles owned (or leased) and operated by the project proponent and associated with the project. Indirect GHG emissions will include emissions generated by energy plants (off-site) supplying energy used on the site of the proposed project during its operation and from vehicle trips to or from the project site during its operation where vehicles are not owned or operated by the project proponent (i.e. freight deliveries employee commuting customer visits). Another source of indirect emissions is the generation transportation treatment and disposal of wastes generated at the site. Waste generation is typically reported in an EIS and should also be evaluated for its contributions to GHG emissions and included in the quantification of total annual emissions." (source: NYSDEC Policy "Assessing Energy Use and Greenhouse Gas Emissions in	

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	Environmental Impact Statements" Issuing Authority Office of Air Energy and Climate)	
BOEM-2024-0001-0313-0033	Affected Environment and Environmental Consequences 3.4.1-4 The PEIS states "The CAA prohibits federal agencies from approving any activity that does not conform to a State Implementation Plan. This prohibition applies only with respect to nonattainment or maintenance areas. Conformity to a State Implementation Plan means conformity to a State Implementation Plan's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of such standards. The activities for which BOEM has authority are outside of any nonattainment or maintenance area and therefore not subject to the requirement to show conformity. However agencies issuing future approvals related to offshore wind projects in the NY Bight are responsible for evaluating the applicability of the CAA General Conformity requirements to their actions." Comment - There is also a concern with the way the impact analysis is compartmentalized for one representative NY Bight Project in terms of air quality the impacts to air quality could be concentrated based on the timing of certain construction activities and could have a synergistic adverse impact to considerations like ozone formation for which there are significant considerations. This also does not account nor analysis for the cumulative impacts of the surrounding planned projects which in terms of air quality could certainly have a localized impact especially during construction and decommissioning of the various projects. It is also concerning that the above paragraph appears to obviate responsibility for air quality concerns based on distance to the shoreline despite the project components and connections that are connected to this larger plan of scale and potentially shared infrastructure with surrounding projects.	Final PEIS Sections 3.4.1.4.3 and 3.4.1.5.3 discuss cumulative impacts. In the absence of COP-specific project proposals, available data are insufficient to determine specific locations of cumulative impacts. BOEM's determination that its actions are not subject to the requirement to show conformity is not related to distance from shore but follows from the language of the General Conformity Rule.
BOEM-2024-0001-0331-0017	BOEM excluded the amount of fossil fuels and chemicals that will be used by the New York Bight projects but we assume based on the number of turbines it will be 55% more than the following numbers for the other NY/NJ projects: coolants 2 million gallons; oils 4 million gallons; diesel fuel 1 million gallons. Including all NY/NJ projects there will be 36000 acres of seabed disturbance for export cables	Final PEIS Section 3.4.1.3.2 discusses potential quantities of fuels and chemicals. In the absence of COP-specific project proposals, any quantitative estimates for fuels, chemicals, and other project characteristics are uncertain.

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	and 33000 acres of disturbance for interarray cables. There will be 827 acres of scour protection and 737 acres of cable hard protection excluding NY Bight since no numbers are provided but we assume the Bight will add 2424 more acres of scour and hard protection in the ocean. There will be over 11 tons of carbon dioxide added to the NJ/NY atmosphere during the construction of the projects.	
BOEM-2024-0001-0331-0036	The PEIS Fails to Address GHG Emissions and SF6 and Mitigation is Inconsistent with the Project's Goals The section AQ Table G-1 of mitigation measures for reducing GHG is nothing more than window dressing. The mitigation measure AQ-1 acknowledges that the offshore wind developers will continue to use SF6 and must evaluate the "feasibility of using non SF6". Lessees are "encouraged" to replace diesel fuel with alternatives and "encouraged" to replace combustion engines with zero -emissions technologies. These mitigation measures have no teeth in actually requiring developers to take any real measures to reduce their carbon footprint. According to the EPA SF6 is the most potent greenhouse gas known to date. It has an atmospheric lifetime of 3200 years and a "relatively small amount of SF6 can have a significant impact on global climate change." Previous EIS documents have significantly minimized the amount of SF6 that will be used in the offshore wind projects. In previous documents BOEM recognizes SF6 as "the most potent greenhouse gas known." Offshore wind developers and BOEM have incomplete of not only the number of offshore substations (OSS) but it has failed to mention the use of SF6 in each of the turbines. The PEIS does not disclose the potential full amount of SF6 that may be used in the projects. The PEIS fails to mention the use of SF6 in each wind turbine generator. Considering that BOEM has admitted in previous EIS documents that there is a yearly loss of SF6 from switchgear disclosing the full amounts that may be used in these projects is crucial. The PEIS does not disclose expected leakage of SF6 in its table listing project emissions. There is no mention of a potential accidental release of SF6 such as happened at the Seagreen offshore wind area in the North Sea in June of 2022 forcing the crew to evacuate their rig. The EPA states that leaks of SF6 can occur during "installation maintenance and servicing and decommissioning" of equipment that contains the gas. The PEIS does	Final PEIS Section 3.4.1.4.1 discusses SF_6 and provides the estimated quantity of SF_6 for one representative project. BOEM encourages lessees to analyze and consider implementing AQ-1 as a RP, as outlined in Table G-2. Measure AQ-1 addresses SF_6 management. Compliance efforts will also be addressed through the USEPA's OCS air permitting process. The lessee will be required to follow all applicable federal, state, and local laws regarding the use and management of SF_6. The environmental decision document for each COP-specific NEPA review will describe the specific terms and conditions of the AMMM measures for which compliance is required.

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	not fulfill its purpose outlining the environmental impact concerning SF6 use since that does not begin and end with the Atlantic Shores projects. As BOEM has previously stated (1) "the impact of GHG emissions does not depend upon the source location." Since numerous wind energy projects in the NJ/NY area will be using SF6 in OSSs and wind turbines the singular approach in evaluating the environmental impact of just NY Bight makes the PEIS flawed and too limited to fulfill its purpose.	
BOEM-2024-0001-0334-0013	Is climate change really happening for the reasons we think? If not need to rush into offshore wind Is moot. Are CO2 reductions by the US meaningful against grosser CO2 emissions elsewhere? Is offshore wind even effective in a green sense?- If green/renewable energy has merit and we want it Is offshore wind even the best choice?	Issues around selection of offshore wind energy for development are public policy questions that are beyond the scope of an EIS and outside of BOEM's authority; therefore, they should be addressed at the federal and state level.
BOEM-2024-0001-0334-0015	Great questions. To the last question I submit it is NOT the best "renewable" choice. It is now becoming clear that the investment required to serve a given number of homes with offshore wind is tremendously overpriced. It can be demonstrated that for small fraction of the offshore wind investment those homes would be better served by their own solar energy system panels and a storage battery. Easily 1/3 the cost or less. These would be supplied by a program to install them by a fully funded state program. If the public comes to understand this they will reject having offshore wind put on their backs and will insist that NJ comes up with a plan that puts the same investment into installing a solar system on every suitable home instead. Period. Case closed. BOEM will be out of the wind business. And maybe out of the ocean leasing business too. Representatives Jeff Van Drew and Chris Smith have been apprised of this. SEE ORIGINAL COMMENT FOR IMAGE: If a Far More Cost Effective Alternative to Off-Shore Wind (OSW) exists NOW that;	Issues around selection of offshore wind energy for development, and its costs, are public policy questions that are beyond the scope of an EIS and outside of BOEM's authority; therefore, they should be addressed at the federal and state level.
BOEM-2024-0001-0345-0001	CCE strongly supports advancing well-sited environmentally responsible renewable energy projects and phasing out the use of antiquated fossil fuels on Long Island and throughout New York State. Thank you for the opportunity to comment on this important renewable energy guidance document. CCE is supportive of this process to streamline the permitting for the six NY Bight projects to ensure that they move forward in both an environmentally responsible and timely manner.	BOEM agrees that development of offshore wind energy projects (to the extent they displace fossil fuels) would bring about climate and environmental benefits.

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BOEM-2024-0001-0345-0002	New York State is a leader in the fight against climate change and a national champion for offshore wind having passed the strongest climate change law in the nation in 2019. The state is working towards achieving mandates of 70% renewable energy by 2030 carbon free electricity by 2040 and a net zero carbon economy by 2050. We cannot achieve these goals particularly in downstate New York without also achieving or exceeding our target of 9000 MW of offshore wind. The Biden administration has announced plans to tackle climate change and put forth a goal of reaching a net-zero carbon economy by 2050. We must work aggressively to support responsibly-sited renewable energy projects like Excelsior Wind Attentive Energy and Community Offshore Wind to meet these critical state and federal goals.	BOEM agrees that development of offshore wind energy projects would help meet state mandates for renewable energy.
BOEM-2024-0001-0345-0004	Climate Change and Wildlife CCE thanks BOEM for its thorough assessment of impacts to fish birds and marine species which should be mitigated to the greatest extent possible. As we know the most immediate impact to these species is climate change. The real danger facing our beaches fisheries and coastal communities is not a wind farm it is rising sea levels ocean acidification warming waters and extreme weather events. These events continue to be a significant threat to downstate New York and to adversely impact our estuaries and our coastal communities. The environmental benefits of advancing offshore wind farms to reduce climate impacts needs to be weighed against any potential impacts associated with construction of offshore wind farms. [Bold Italics: CCE believes that offshore wind is one significant part of the antidote in fighting climate change.] Long Island and New York City are already experiencing negative ecological and economic impacts of climate change. We need to be at the forefront of the transition to renewable energy and offshore wind development in the US.	BOEM agrees that development of offshore wind energy projects would (to the extent they displace fossil fuels) help reduce GHG emissions that contribute to climate change. Potential impacts of construction activities on each resource area are discussed in the respective sections of the Final PEIS.
BOEM-2024-0001-0345-0005	The National Ocean and Atmospheric Administration (NOAA) predicts under a worst- case scenario a 6 ft sea level rise will cause most of the barrier islands and Long Island homes south of Merrick Road (route 27A) to be flooded or under water with more than 150 municipalities impacted. Homes and infrastructure are already being raised including roads in Freeport Lindenhurst Smithtown and Southampton as well as the Shelter Island ferry while residents in the	As discussed in the Final PEIS, development of offshore wind energy projects (to the extent they displace fossil fuels) would help reduce GHG emissions that contribute to climate change including the impacts noted by the commenter.

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	most vulnerable communities are facing managed retreat and home buyouts. These communities are in an exceptionally vulnerable position to extreme weather events. Superstorm Sandy destroyed or damaged 95000 buildings on Long Island and caused $19 billion in damages to New York City. We are experiencing the increasing occurrence of "hundred-year storms" and increased precipitation during rain and snow events and the problem will only get worse. NOAA predicts that in a worst-case sea level rise scenario the average high tide in NYC will be 2 feet higher than the storm surge during Superstorm Sandy. High costs of repairing damage from extreme weather events like Superstorm Sandy and Hurricane Irene coupled with the need to raise homes and pay increased flood insurance premiums are impacting struggling homeowners in coastal communities. In addition to major storms south shore communities are already experiencing "sunny day flooding" due to higher tides. This means on sunny day there is still street flooding and property damage. Extreme weather events are not our only challenge. Warmer winters coupled with longer hotter summers are creating more hospitable conditions for invasive species deer ticks and mosquitos that carry diseases and reduced agricultural yields. Increased summer temperatures and more severe heat waves also degrade air quality increase health care costs and put lives at risk. In the U.S. air pollution from burning fossil fuels leads to annual losses of $600 billion and the loss of 230000 lives. In NYC approximately 130 residents die each year just from heat waves with the number expected to rise over the coming century. Both Suffolk County and NYC regularly receive an "F" for air quality by the American Lung Association and experience disproportionately high rates of asthma heart disease and other chronic health issues in disadvantaged communities. Transitioning to offshore wind will significantly curb air pollution and provide quantifiable health benefits for New Yorkers. Air pollution reductions from the first 2400 MW of offshore wind in New York would be valued at roughly $1 billion and would avoid an estimated 100 premature deaths each year.	

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	Ocean acidity has increased 30% since the industrial revolution and there are documented negative impacts to sea scallops squid clams oysters and other species in the northeast. The catastrophic lobster die-off in the Long Island Sound is mainly attributed to warmer waters. The native lobster species and its historic maritime industry declined 90%. The industry used to account for tens of millions of dollars annually. The loss of this fishery is not only an economic loss but also means this historic maritime culture is slipping away.	
BOEM-2024-0001-0345-0006	It is critical that BOEM measure all potential impacts of offshore wind projects in comparison to the adverse impacts of fossil fuels and include climate change impacts that would result from a "No Action" alternative.[Bold Underline: The choice is not between wind and nothing; it is between wind and fossil fuels.] For instance if we generate 3000 MW of power with offshore wind BOEM needs to compare any environmental impacts associated with this generation of power to environmental impacts of 3000 MW generated by fossil fuels. What are the emissions associated with each over the expected life of the wind farm? Findings under the "No Action" alternative are substantial and serve to illustrate that while all energy projects have some negative impacts the impacts of doing nothing and continuing our reliance on fossil fuels are significant and unacceptable. Potential adverse impacts under the "No Action" alternative for several categories including the fishing industry finfish invertebrates and essential fish habitat marine mammals and sea turtles coastal habitats and wetlands due to climate change. Including but limited to the impacts of warming ocean waters shifts in food sources impacts associated with increased acidification in both ocean waters and estuarine systems. As well as the continued impacts of oil and gas leaks and spills into the marine environment when conducting fossil fuel exploration activities and general operation of extraction of fossil fuels. Potential adverse impacts on air quality due to increased greenhouse gas emissions and air pollutants on water quality and on environmental justice communities.	Final PEIS Section 3.4.1.4 presents estimated emissions from NY Bight wind projects and the emissions from fossil-fuel power generation that would be avoided (to the extent that the wind projects displace fossil fuels). For each resource area, the respective sections of the Final PEIS analyze the potential adverse impacts with the No Action Alternative.

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BOEM-2024-0001-0345-0007	Ultimately the offshore wind cooling systems would cause substantially less impact than the "No Action" alternative and would also offset the fossil fuel pollution entering our communities and local waterways leading to improved water quality and air quality in local Long Island communities. [Bold Italics: CCE asks that BOEM include an analysis of the benefits of decreased fossil fuel pollution as offshore wind allows us to retire these plants.]	Final PEIS Section 3.4.1.4 discusses the emissions from fossil-fuel power generation that would be avoided (to the extent that wind projects displace fossil fuels) with NY Bight offshore wind development.
BOEM-2024-0001-0345-0008	CCE also thanks BOEM for evaluating not only the potential adverse environmental impacts but also the potential benefits including air quality improvements in disadvantaged communities due to decreased fossil fuel pollution	Thank you for your comment.
BOEM-2024-0001-0345-0013	Opponents of offshore wind testified during the virtual public hearings that offshore wind projects will have no overall impact on climate change. Transitioning from old antiquated fossil fuels plant to wind power will absolutely have positive impacts locally. It would be helpful for BOEM to provide specific data comparing the greenhouse gas emissions from local fossil fuel plants on our air and water quality vs the emissions we will see over the lifespan of these offshore wind projects. Offshore wind farms are NOT meant to be additive to the power grid but rather the specific goal is to replace and shutter existing fossil fuel power stations.	Final PEIS Section 3.4.1.4 discusses the emissions with NY Bight offshore wind development as well as the avoided emissions from fossil-fuel power generation (to the extent that wind projects displace fossil fuels).
BOEM-2024-0001-0355-0002	Wind Turbines…Not green. Not the answer to reducing carbon footprint - they actually utilize a lot of fossil fuels and create a lot of greenhouse gases in the manufacturing transportation installation and maintenance.	As stated in Final PEIS Section 3.4.1.4.1, emissions from mining and manufacturing are not included in the analysis. However, lifecycle considerations are discussed in Section 3.4.1.4.1. As indicated in Section 3.4.1.4.1, although wind energy has higher upstream emissions than many other generation methods, its lifecycle GHG emissions are orders of magnitude lower than from other generation methods.
BOEM-2024-0001-0362-0032	Strengthening the nation's supply chains can result in environmental benefits as well. Energy intensive manufacturers in the United States are relatively clean compared to competitors. As one example "[s]teel exporters to the U.S. emit 50-100+% more CO2 emissions per ton than U.S. producers on average." [Footnote xvii: CUR Consulting Leveraging a Carbon Advantage: Impacts of a Border Carbon Adjustment and Carbon Fee on the US Steel Industry 2021. https://clcouncil.org/reports/leveraging-a-carbon-advantage.pdf?v1]	BOEM agrees that strengthening domestic supply chains and increasing domestic content can lead to environmental benefits.

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	Use of domestic content can also reduce shipping distance and thus emissions resulting from long-distance maritime transportation. The International Maritime Organization estimates that maritime shipping generated 1 billion tons of greenhouse gases per year from 2007-2012. Another study estimates that maritime shipping emissions are forecasted to rise between 35% and 210% by 2050. [Footnote xviii: The Journal of Labor and Society Right-to-work Laws and Fatalities in Construction June 2011. https://deepblue.lib.umich.edu/bitstream/handle/2027.42/98283/j.1743-4580.2011.00334.x.pdf?sequence=1]	
BOEM-2024-0001-0383-0022	Wind Wake Effect: BOEM's PEIS section regarding wind wake effect seems to deliberately exclude newer information that demonstrate even New York Bight specific impacts. For example Appendix B of the PEIS briefly discusses "wake effect" and quotes a Christiansen paper from 2005. Yet it does not incorporate a paper from the same author Christiansen from 2022 which discusses wind wake effect in more detail and even concludes that "surface temperature primarily increases in the vicinity of offshore wind farms" due to the wind farm wake effect and that the resulting "large-scale surface heating of up to 0.1 degrees C imitates the effects of climate change." [Footnote 56: See Christiansen et al "Emergence of Large-Scale Hydrodynamic Structures Due to Atmospheric Offshore Wind Farm Wakes" Frontiers in Marine Science 2022 at https://www.frontiersin.org/articles/10.3389/fmars.2022.818501/full p. 12.] It also excludes a 2022 report by ArcVera Renewables entitled "Estimating Long-Range External Wake Losses in Energy Yield and Operational Performance Assessments Using the WRF Wind Farm Parameterization" which specifically analyzed the potential for large project to project wake impacts for the New York Bight lease areas resulting in simulations depicting wind speed deficits of 7% up to 100 km away from the wind facility with a 28.9% loss of wind at the wind farm itself. [Footnote 57: Stoelinga et. al. "Estimating Long-Range External Wake Losses in Energy Yield and Operational Performance Assessments Using the WRF Wind Farm Parameterization" ArcVera Renewables 2022.] We request that these be included.	Discussion of the two references requested by the commenter has been added to Appendix B.

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BOEM-2024-0001-0383-0023	Additionally the newest 2024 study by Pryor and Barthelmie "Power Production Inter- and Intra-Array Wake Losses from the U.S. East Coast Offshore Wind Energy Lease Areas" found the New York Bight leases to be some of the most impacted leases in all US waters by the wind wake effect: "The climatological mean wake loss for NYBIG is 31.0%...The cumulative wake extent increases with the total number of wind turbines installed and this is systematically the highest for the NYBIG layout the 'second generation' lease areas in NYBIG are significantly impacted by their wind farm wakes in multiple flow regimes (Figures 4 and 5). Further for the NYBIG layout when the Fitch WFP is used there is no area south of Long Island that is not covered by the combined shadow of the existing LA." [Footnote 58: Pryor and Barthelmie "Power Production Inter- and Intra-ArrayWake Losses from the U.S. East Coast Offshore Wind Energy Lease Areas" Energies 2024 available at Power Production Inter- and Intra-Array Wake Losses from the U.S. East Coast Offshore Wind Energy Lease Areas (Journal Article) | OSTI.GOV p. 14 16-17.] The study concludes that "The offshore wind energy deployments being developed along the U.S. east coast far exceed those that characterize existing offshore wind deployments and so are expected to experience greater wake losses." [Footnote 59: Ibid p. 25.]This information contains tremendous implications for both environmental impacts and affects to the Mid Atlantic Cold Pool as well as the cost/benefit analysis expected to result from construction of the New York Bight leases. It is clear that the production and the claimed power output will not reach the nameplate capacity of the project and that the purported project "benefits" will be significantly curtailed by wind wake effects for these leases in particular. BOEM should also include in its analysis how the wind wakes from the NY Bight projects will be expected to curtail production of previously approved projects.	Because wind wake effects influence the amount of energy produced by a wind farm, BOEM expects that applicants will take wind wake effects into account in planning wind farm developments. BOEM will consider including changes in energy production due to wind wake effects in future estimates of avoided emissions to the extent data are available.
BOEM-2024-0001-0394-0001	Claimed tonnage of carbon dioxide emissions spared annually is not supported by the disclosures in the DEIS which omits carbon emissions that will necessarily occur as the result of the project resulting from mining and materials production for refined steel and concrete materials. We've calculated for steel production and have yet to calculate for concrete. The infrastructure is massive; It is not	As stated in Final PEIS Section 3.4.1.4.1, emissions from mining and manufacturing are not included in the analysis. However, lifecycle considerations are discussed in Section 3.4.1.4.1. As indicated in Section 3.4.1.4.1, although wind energy has higher upstream emissions than many other generation methods, its

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	appropriate to omit this when calculating emissions as other types of power plants do not require anywhere near the amount of materials to build. The cumulative effect of Mayflower Wind project combined with other wind power plants is an enormous increase the metal and concrete surface area in the marine environment (a.k.a marine industrialization or marine urbanization) is expected to cause a population explosion of sessile (attached) filter-feeding heterotrophs which will reduce autotrophic plankton (photosynthetic plankton) density over the Outer Continental Shelf and via this mechanism its capacity to serve as a carbon buffer (which is important for pulling carbon dioxide out of the atmosphere) may be impaired.	lifecycle GHG emissions are orders of magnitude lower than from other generation methods. As living organisms, phytoplankton themselves respire and therefore produce CO_2. The consumption of phytoplankton by filter-feeding organisms (such as those that may colonize WTG foundations and scour protection) plays an important role in the carbon cycle; the loss of phytoplankton to consumers results in the creation of fecal pellets and pseudofeces that fall to the bottom and can eventually become buried, serving as a major CO_2 sink. BOEM is not aware of any scientific studies documenting a decrease in phytoplankton abundance in the presence of other large offshore structures such as oil and gas rigs in locations such as the Gulf of Mexico, which currently has over 4,000 rigs, nor is BOEM aware of any studies documenting increased CO_2 in the presence of these offshore structures.
BOEM-2024-0001-0421-0001	It is essential that we continue to develop sustainable sources of energy that do not add pollutants to the air we breathe or contribute to global warming. I support the Biden administration's efforts to build offshore wind power by 2030 and urge the Bureau of Ocean Energy Management to conduct a timely and thorough environmental review for the six offshore wind projects proposed for the New York Bight.	BOEM agrees that development of offshore wind energy projects (to the extent that they displace fossil fuels) would bring about climate and environmental benefits. The Final PEIS thoroughly evaluates the potential environmental impacts of six projects to the extent possible at the programmatic level. BOEM expects that further, more specific analysis will be performed as additional information becomes available when applicants file COPs for projects.
BOEM-2024-0001-0423-0011	Other AMMM Measures of Concern Air Quality The air quality AMMMs are disproportionate to BOEM's own impact analysis are an overreach of jurisdiction and are duplicative of EPA air permitting. In its Table 2-4 (summary and comparison of impacts among alternatives) BOEM states that the "no action" alternative "would result in overall moderate impacts" for the cumulative impact scenario. Alternative B would also result in moderate impacts however in Alternative B BOEM notes that:[italicized: "six NY Bight projects and other offshore wind projects would have moderate beneficial impacts on air quality in the region surrounding six NY Bight projects to the extent that energy produced by offshore wind projects would displace energy produced by fossil-fuel power plants."][Footnote 2: Draft PEIS Table 2-4 page 2-24.]	AMMM measures fall within BOEM's authority under 30 CFR 585.102(b) to approve COPs with conditions. AMMM measures address BOEM's concerns, which may not be precisely the same as EPA's, or they may address impacts that are outside of EPA's OCS permitting jurisdiction. Comment on Table 2-4 acknowledged. Regarding Alternative C, the fact that beneficial impacts would occur during O&M does not reduce the need and desirability of reducing impacts during both construction and O&M. AMMM measures fall within BOEM's authority to approve COPs with conditions. AMMM measures address BOEM's concerns, which may not be precisely the same as EPA's, or they may address impacts that are outside of EPA's OCS permitting jurisdiction.

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	Alternative C does not alter the moderate negative impacts that would occur even under no action yet BOEM seemingly ignores the beneficial impacts of offshore wind and would impose specified AMMM Measures that have never been required in other COP approvals.AQ-1 through AQ-5 require the Lessee to evaluate the feasibility of each listed measure and each AMMM concludes with the statement that [italicized: "Any instances where the Lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE [the Bureau of Safety and Environmental Enforcement]."] The Clean Air Act and not the PEIS is the appropriate mechanism for regulating the emissions associated with the NY Bight projects. These AMMMs duplicate the EPA process and requirements. Moreover as noted in the Draft PEIS these projects will have beneficial impact on air quality. Creating additional regulatory requirements and costs given the existence of EPA process would undermine and slow achievement of that net benefit and create cost that would ultimately flow back to electricity customers.	
BOEM-2024-0001-0423-0019	[bold: AQ-6 and AQ-7] relate to onshore measures that are regulated by the states and local governments (and again are outside of BOEM's jurisdiction) and therefore should not be included in the PEIS. Lastly and as a general matter on air quality Ocean Winds notes that there is already a shortage of Jones Act compliant marine construction and support vessels in the U.S. The offshore wind industry competes with oil and gas developers and other maritime users for this same small fleet of vessels (e.g. platform supply vessels service operations vessels crew transfer vessels offshore tugs barges anchor handling vessels jack-up vessels etc.). As it is in the hands of vessel owners and port operators whether to adopt the proposed measures put forward in the air quality AMMMs they may find it less expensive and more profitable to support work outside the offshore wind industry where these restrictions are not in place. This would further limit the availability of usable vessels and ports to our industry putting further pressure on project viability.	AQ-6 and AQ-7 are included in the Final PEIS as RPs. BOEM encourages the lessees to consider the feasibility of these mitigation measures in their individual projects. AMMM measures fall within BOEM’s authority under 30 CFR 585.102(b) to approve COPs with conditions. A lessee has the option to demonstrate that an AMMM measure is infeasible. BOEM expects that excessive costs and unavailability of vessels could be factors in a demonstration that an AMMM measure is infeasible on a case-by-case basis.

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BOEM-2024-0001-0426-0001	H.L. Mencken once said "there is always an easy solution to every problem - neat plausible and wrong." He could be speaking to New Jersey's current quest to achieve the very worthwhile objective of 100% clean energy by 2035. A major focus in this plan is significant investment and development of an offshore wind industry off the New Jersey coast. Clean energy is certainly something we should strive for but in many ways our current blind crusade devil be damned towards the implementation of offshore wind does present troubling questions which may not have been sufficiently addressed yet.	BOEM agrees that development of offshore wind energy projects would help meet state mandates for renewable energy.
BOEM-2024-0001-0426-0010	From an ecological standpoint too many differing opinions still exist on the effect on birds fish mammals and the overall ocean environment. The effect of hurricanes with high winds and huge waves on thousand-foot structures permanently anchored to the ocean floor present other questions. Offshore Wind Requires a Second Look at True Motives H.L. Mencken also once said: "The urge to save humanity is almost always a false front for the urge to rule." Our clean energy future and our environment are far too important to be driven by special interests naive idealism or for-profit developers. Fred Fastiggi-Principal Shoreline Energy Advisors	Final PEIS Section 2.3 discusses design features of WTGs to accommodate extreme weather, including hurricanes.
BOEM-2024-0001-0433-0001	New Jersey is on the frontlines of the climate crisis with ever increasing sea level rise heavy rain events and both coastal and inland flooding. To achieve the necessary carbon emission reductions to protect our communities from the climate crisis we need a major transition in our energy sector now. Offshore wind is one of our greatest clean energy solutions that will benefit the local economy and communities here in our state without the further burning of fossil fuels.	BOEM agrees that development of offshore wind energy projects (to the extent that they displace fossil fuels) would help reduce GHG emissions that contribute to climate change.
BOEM-2024-0001-0433-0003	Offshore wind will also benefit the overall air quality of our region which suffers greatly from a dense population and overwhelming industry pollution. We need to invest in offshore wind to bring relief to people who suffer from asthma heart disease and other medical conditions. The projects in these lease areas will directly allow our communities in NJ to breathe easier and we urge BOEM to move quickly to protect the health of our future generations.	BOEM agrees that development of offshore wind energy projects (to the extent that they displace fossil fuels) would reduce air pollutant emissions from power plants.

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BOEM-2024-0001-0436-0004	Environmental Benefits of Offshore Wind Development The PEIS should clarify the climate (i.e. greenhouse gas emission reduction) air quality and other environmental benefits of offshore wind development and view alternatives and AMMMs in that context. The PEIS is generally focused on negative environmental impacts without a balanced discussion of how offshore wind development is essential for transitioning our national energy supply and reducing environmental impacts. [Footnote 4: See e.g. Affected Environment and Environmental Consequences 3.4.1-10 ("Increasing energy production from offshore wind projects could reduce regional GHG emissions by displacing energy from fossil fuels. The amount of emissions reduction from displaced generation is uncertain because the future grid mix is not known. This reduction would likely more than offset the relatively small GHG emissions from offshore wind projects. This reduction in regional GHG emissions would be noticeable in the regional context and contribute incrementally to addressing climate change and would represent a moderate beneficial impact in the regional context but a negligible beneficial impact in the global context.").]	Final PEIS Section 3.4.1.4.1 provides estimates of GHG reductions, avoided health effects, and the social cost of GHGs. Issues around reducing the carbon intensity of the national energy supply are public policy questions that are beyond the scope of an EIS and outside of BOEM's authority. These issues should be addressed at the federal and state level.
BOEM-2024-0001-0436-0005	The PEIS vastly underestimates energy production from lease areas and conducted an impact assessment based off only 8.6 GW of reasonably foreseeable wind power on the OCS. Table 3.4.1-4.	Table 3.4.1-4 presents an example scenario, as discussed in Final PEIS Section 3.4.1.3.2, and does not represent the potential generation capacity or avoided health impact of developing all lease areas in the NY Bight. Table 3.4.1-7 provides the estimated avoided health impacts of one representative project comprising 280 WTGs.
BOEM-2024-0001-0436-0006	The environmental benefits from offshore wind therefore have been discounted and negative impacts (e.g. construction air emissions) have been overstated. In the impact assessment the Final PEIS must address the environmental benefits of offshore wind development particularly as context for analysis of Clean Air Act criteria air pollutants and greenhouse gas emissions from construction and operations.	Final PEIS Section 3.4.1.4.1 provides estimates of environmental benefits, including criteria pollutant and GHG emissions reductions, avoided health effects (to the extent that wind projects displace fossil fuels), and the social cost of GHGs.
BOEM-2024-0001-0439-0025	Furthermore climate change benefits need to be further explained throughout the PEIS. For example in the air section the PEIS states that "offshore wind projects" would "represent a moderate beneficial impact in the regional context but a negligible beneficial impact in the global context."[Footnote 50: Draft PEIS at 112790]	A determination of “moderate” or “negligible” is a qualitative evaluation. The “30x30 goals” may refer to the U.S. Department of Energy (DOE) Offshore Wind Energy Strategy, a summary of DOE’s efforts to meet President Biden’s goal to deploy 30 GW of offshore wind energy by 2030 and set the nation on a pathway to

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	These statements can be confusing and misleading as noted by several speakers at the public hearings. Whenever global climate change impact is discussed it should be explained in the context of the outsized contribution offshore wind will have on meeting US 30x30 goals and the importance of US reductions as it is a major producer worldwide of greenhouse gas emissions.	110 GW or more by 2050. Discussion of the DOE strategy has been added to Final PEIS Section 3.4.1.
BOEM-2024-0001-0467-0001	UPROSE and NYC-EJA strongly urge amending and adopting Alternative C (Proposed Action) to account for the cumulative impacts of air pollution. Specifically we urge Alternative C to prioritize the elimination rather than simply the reduction of air pollutants arising from direct and indirect offshore wind activities in the New York Bight. This must be realized in a requirement by BOEM that lessees electrify vehicles and vessels directly involved in offshore wind activities in the New York Bight and prioritize low co-pollutant fuels over traditional marine or fossil fuels where electrification is technically infeasible. BOEM must also require lessees to avoid using "false solutions" like natural gas propane and hydrogen as a facade to address climate and environmental justice impacts. Advocates and researchers recognize these technologies as fuels that 1) continue to emit air pollutants when combusted disproportionately in climate and environmental justice communities in similar or greater amounts as other fossil fuels and 2) do not significantly reduce greenhouse gas emissions <insert source here>.	BOEM's designation of the AQ AMMM measures as RPs encourages lessees to consider practices such as electrification and the use of low-carbon fuels. Lessees are also encouraged to provide justifications if these RPS are determined to be infeasible. Final PEIS Table 3.4.1-10 lists the AMMM measures for air quality/GHGs.
BOEM-2024-0001-0468-0001	Potential development of the lease holdings would assist with meeting several state mandates for renewable energy including New Jersey's goal of 11 GW of offshore wind energy generation by 2040 is outlined in New Jersey Executive Order No. 307 issued on September 21 2022; New York's requirement of 9 GW of offshore wind energy generation by 2035 is outlined in the Climate Leadership and Community Protection Act signed into law on July 18 2019. Additionally an estimated 16-18 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022). Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy.	BOEM agrees that development of offshore wind energy projects would help meet state mandates for renewable energy.

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BOEM-2024-0001-0506-0001	I support the orderly and equitable development of offshore wind energy capture installations in the New York Bight. They can add significantly to renewable energy capture in this area as vitally needed in order to reduce the use of CO2-producing fossil fuel for electricity generation.	BOEM agrees that development of offshore wind energy projects (to the extent that they displace fossil fuels) would help reduce GHG emissions that contribute to climate change.
BOEM-2024-0001-0522-0003	Health I support offshore wind development because a transition to clean energy won't just fight climate change it will also help improve the air New Jerseyans breathe. While our state's air has improved in recent decades it still ranks among the worst in the nation. We need to invest in offshore wind to bring relief to people who suffer from asthma heart disease and other medical conditions. The transition to cleanly produced offshore wind will bring particular benefits to those most at risk of heart and lung conditions: children and seniors. I'm calling on BOEM to act quickly to secure our clean energy future to protect the health of an entire generation of children. I urge you to proceed with the offshore wind leases in the New York Bight. It is critical to center community engagement and prioritize the advancement of this project that will help reduce pollution mitigate against the worst impacts of climate change and bring family-sustaining jobs to the area.	BOEM agrees that development of offshore wind energy projects (to the extent that they displace fossil fuels) would reduce air pollutant emissions from power plants.
BOEM-2024-0001-0522-0005	Please commit to this project and reject efforts to slow it down or block it so that New Jersey communities and the environment can be protected from harmful pollution and the worst effects of fossil-fuel-driven climate change.	BOEM is committed to facilitating offshore wind energy development in an economically and environmentally responsible way. For any COP-based project, the lessee is responsible for meeting applicable permitting and regulatory requirements.
BOEM-2024-0001-0523-0001	My interest in supporting renewable energy projects generally and the Beacon Wind project in particular is simply because like many parents in my community I worry about the local and global environmental conditions they will inherit. The scientific consensus is absolutely clear that to avert the most devastating impacts of climate change for future generations---for our children and grandchildren---we must act urgently to reduce carbon pollution and supporting renewable energy projects like Beacon Wind is absolutely crucial to that.	This comment refers to Beacon Wind and, as such, is not a comment on the NY Bight Final PEIS. BOEM agrees that development of offshore wind energy projects (to the extent they displace fossil fuels) would help reduce GHG emissions that contribute to climate change.
BOEM-2024-0001-0523-0002	First the Beacon Wind project will provide energy to New York City's power grid and thereby let New York City begin transitioning away from the fracked gas power that New Yorkers are so strongly	This comment refers to Beacon Wind and, as such, is not a comment on the NY Bight PEIS. BOEM agrees that development of offshore wind energy projects (to the extent that they displace

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	opposed to as witnessed by the overwhelming opposition to NRG's proposed Williams pipeline recently. Fracked gas in addition to being a greenhouse gas pollutes our communities' air and contributes to poor health outcomes including asthma which many Brooklyn children disproportionately suffer from. Fracked gas pipelines pollute all the communities they pass through but especially those with vaporizers which is why New Yorkers worked so hard recently to defeat National Grid's plan for new vaporizers in North Brooklyn. Again projects like Beacon will enable us to begin transitioning away from these sources. Second without offshore wind New York will not be able to meet its mandate for clean energy as specified by New York's Climate Leadership and Community Protection Act (CLCPA).	fossil fuels) would support state renewable energy mandates, reduce air pollutant emissions, and reduce GHG emissions that contribute to climate change.
BOEM-2024-0001-0523-0004	I encourage BOEM in writing the draft and final EIS to consider the important environmental risks and damages of NOT taking advantage of this opportunity. In doing so BOEM would miss an important opportunity to help our communities reduce their greenhouse gas emissions improve local air quality and protect biodiversity globally through reducing greenhouse gasses. To summarize for those of us who are parents and want to protect our children's future the only reasonable course of action today is to support efforts to transition to clean energy sources rapidly. The Beacon Wind project is an excellent opportunity to do that and to build cleaner healthier communities here in New York for our children. That's why so many Brooklyn families support this project and I hope BOEM will too.	This comment refers to Beacon Wind and, as such, is not a comment on the NY Bight PEIS. BOEM agrees that development of offshore wind energy projects (to the extent they displace fossil fuels) would reduce air pollutant emissions and reduce GHG emissions that contribute to climate change.
BOEM-2024-0001-0528c	In addition, there's no evidence that this industrialization will stop climate change. In fact, by BOEM's own admission, quote, There will be no collective impact on global warming as a result of offshore wind projects.	No single project can reduce GHG emissions enough to have a measurable impact by itself on climate change. The GHG emission reductions from one NY Bight project would contribute individually, in combination with all other GHG reductions, toward slowing the rate of climate change.
BOEM-2024-0001-0528z	For all those stating that we need to do this, as other commenters mentioned, according to BOEM's Vineyard Wind, FEIS. Page 76, quote overall, it is anticipated that there would be no collective impact on global warming as a result of offshore wind projects end quote. It seems like cumulative sum cumulative impacts, equal cumulative assumptions.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.

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BOEM-2024-0001-0529n	BOEM has already admitted in their documents that these turbines will have no effect on climate change. According to Page 76, BOEM's Vineyard Wind 1 FEIS Volume 2	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0528bb	The South Bronx has remained the poorest urban Congressional district in the U.S. It's also afflicted with some of the worst air pollution rates in the state and country. We experience it by being near the vehicle intensive pollution of the Deegan, the Bruckner, and the Cross Bronx highways, the pollution of industrial and warehouse facilities, and the power, authority, and natural gas plants in Morris, in Port Morris, among others. The Bronx is Community District One, in which I live, has the highest childhood asthma hospitalization rates in the city.	Thank you for your comment. Please see Section 3.4.1.1., *Description of the Affected Environment and Future Baseline Conditions*, for more information on designated nonattainment or maintenance areas for carbon monoxide (CO), particulate matter with diameter of 2.5 microns and smaller ($PM_{2.5}$), or O_3 in the geographic analysis area. BOEM will conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing additional site- and project-specific analyses that were not already addressed by the PEIS.
BOEM-2024-0001-0528gg	We're about to destroy an entire, the entire ecosystem with the mass construction when BOEM's own documents state and I quote overall it is anticipated that there will be no collective impact on global warming as a result of offshore wind projects. Now that is quoted.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0310g	In the applicant's own admission, offshore wind will have little to no effect on climate change or reducing the carbon footprint.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0310h	In BOEM's own documents it states, "Overall, it is anticipated that there will be no collective impact on global warming as a result of offshore wind projects."	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0310l	U.S. Government Bureau of Ocean Energy Management, BOEM, admits that U.S. offshore wind projects would by themselves probably have an admitted impact on global emissions and climate change and the benefit would be negligible.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0310n	BOEM's own documents claim that offshore wind will have little to no effect on global warming and carbon emissions. BOEM also claims that offshore wind will have a dampening effect on the wind, reducing the winds ability to cool sea surface temperatures.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, *Presence of Structures*, which discusses hydrodynamics, including atmospheric wakes.

Comment No.	Comment	Response
BOEM-2024-0001-0310o	According to another BOEM document, "Overall, it is anticipated that there would be no collective impact on global warming as a result of offshore wind projects," stated in Vineyard Winds' final Environmental Impact Statement.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0310q	As far as I know, the greenhouse emissions expended to build and install these turbines is completely left out of the EIS calculation requirements. 2000 ton 6-inch thick steel wall monopoles from Germany and tower assemblies from Spain and lifted and pounded into place by foreign flagged gigantic ships, generator nacelles filled with rare earth components and blade assemblies weighing tens of hundreds of tons more, all the geotechnical surveys and support operations completely left out. I consider that intentional deception. Maybe things aren't as green as they'd like us to believe. All proposed sources of energy should be required to have cradle-to-grave calculations so we can make honest decisions.	Please refer to response to comment BOEM-2024-0001-0528hh for more information on emissions from manufacturing.
BOEM-2024-0001-0529hh	I mean to sum up, BOEM itself states, there will be no collective impact on global warming as a result of offshore wind projects. These projects are not the answer.	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions.
BOEM-2024-0001-0529hh	And I think you know anybody that picks up the documents and reads and will find right away that fossil fuels are used in all phases of turbine manufacturing, construction, the operation of the wind for our projects, the maintenance, and will be so, well also in the decommissioning, and that's through net increases and carbon emissions from increase shipping, trucking, helicopter traffic, all used to construct and maintain these, not to mention all the steel and other fossil fuels or other products that need, rely on fossil fuels to be constructed, so. The documents also reveal the amounts of, significant amounts of petrochemicals and lubricants necessary for operation of the turbines ongoing, I suggest people look into that.	As stated in Final PEIS Section 3.4.1.4.1, emissions from manufacturing and other "upstream" sources are not included in the analysis. However, life cycle considerations are discussed in Section 3.4.1.4.1. As indicated in Section 3.4.1.4.1, although wind energy has higher upstream emissions than many other generation methods, its lifecycle GHG emissions are orders of magnitude lower than from other generation methods.

P.5.4 Water Quality

Table P.5-4. Responses to Comments on Water Quality

Comment No.	Comment	Response
BOEM-2024-0001-0175-0002	No one has explained in detail a few of my concerns such as:[Bold: Substations“] "An open loop cooling system is used to dissipate heat from the conversion of AC to DC . Cool water is taken in and comes out up to 8100000 per day at 86-90f with chlorine residuals as they use that to keep pipes clear." If you are truly concerned with climate change and warming oceans why would you even consider putting that many millions of gallons of sea water at that temperature which will be chemically treated back into the ocean? How will this not negatively and/or irreversibly impact the ocean and its inhabitants? Multiply that amount of sea water by how many substations will be in place multiplied by 365 days in a year times 25 years. I suggest someone should read [Underline: Marine ecological impact analysis of residual chlorine ...] by S Youping 2023 where he states "The free residual chlorine in seawater is more toxic to aquatic organisms".	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Discharges/Intakes,* to further describe the minimal impacts of the open loop cooling system.
BOEM-2024-0001-0180-0003	The wind farm development of the New York Bight will cause the certain pollution of our ocean through blade erosion petrochemical leakage and electromagnetic radiation presented by underground cables. Documented neurological problems will occur to the human population living in close proximity. There will be negative effects to our wind currents and deep water currents. I understand your stance of a need to mitigate the effects of climate change but destroying our ocean is not the answer. At least give the public scientists and our elected officials time to properly review this document and related research.	Thank you for your comment. Please see the Presence of Structures IPF and Accidental Releases IPF discussions within Sections 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*; 3.4.2.4.1, *Impacts of One project;* 3.4.2.4.2, *Impacts of Six Projects*; and 3.4.2.5, *Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage*.
BOEM-2024-0001-0259-0001	It is imperative that the development of wind energy farms receive adequate research evaluation and modeling of potential inter-annual effects on the local ecosystem from the first development-related activities to post-operations years after installations. As noted in a recent BOEM supported study producing a Consensus Report by National Academies of Sciences Engineering and Medicine in 2023: Potential Hydrodynamic Impacts of Offshore Wind Energy on Nantucket Shoals Regional Ecology: An Evaluation from Wind to Whales. Washington DC: The National Academies Press.	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures* for the discussion of hydrodynamic effects.

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	https://doi.org/10.17226/27154 "the impacts on ecosystems from development and operation of offshore wind may be difficult to distinguish from natural and other anthropogenic variability (including climate change)". Further "A single offshore wind turbine can alter local hydrodynamics... arrays of turbines in a wind farm or at multiple adjacent offshore wind farms...become more complex with implications for both local and regional circulation. Understanding these hydrodynamic effects is essential to develop predictions of the potential impacts of wind farms on the region's ecosystem from phytoplankton to marine mammals". (p.2)	
BOEM-2024-0001-0313-0018	Offshore Activities and Facilities Page 2-7 states "One NY Bight project would install between 50 and 280 WTGs within a NY Bight lease area in a grid layout at a minimum spacing of 0.6 by 0.6 nautical mile (1.1 by 1.1 kilometers). The WTGs considered would have a rotor diameter up to 1214 feet (370 meters) and a blade tip height that extends up to 1312 feet (400 meters) above mean sea level (AMSL) (Figure 2-2). A single NY Bight project would install 15 OSSs that would serve as common collection points for power from the WTGs as well as the origin for the offshore export cables that deliver power to shore (Figure 2- 1). NY Bight lessees may use HVAC or HVDC technology to transmit power from the wind farms to shore.2 Different equipment would be required on each OSS depending on whether HVAC or HVDC technology is used. An HVAC system is typically used to transport energy onshore when the wind farm is within about 30 miles (50 kilometers) of the shore (Middleton and Barnhart 2022). Due to the distance of the NY Bight lease areas to shore (which at their closest points are between 22 and 45 miles [35 and 72 kilometers] offshore) if HVAC OSSs are chosen an HVAC booster station or a reactive compensation station may be required along the export cable route to offset against power losses between the offshore wind farm and the grid. HVAC booster stations are generally similar in size and foundation type to an OSS. HVDC systems operate by converting the alternating current (AC) high voltage electricity produced by the WTGs to direct current (DC) for transport to shore and then once onshore convert the electricity back to AC for distribution to the grid. HVDC systems do not experience the same losses in power experienced on AC transmission	Thank you for your comment. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. This should be included in the project-specific, COP-level NEPA analysis. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Discharges/Intakes,* which discusses the minimal impacts of the open loop cooling system. The project-specific, COP-level NEPA analysis will also provide greater details.

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	lines at long distances and do not require booster stations along the export cable route. Because of the large amount of heat generated during the conversion of AC to DC at the HVDC converter OSS located in the wind farm these systems must be cooled when operating. The most common type of cooling system is an open loop system that intakes cool filtered sea water and discharges warmer water back into the ocean. Chemicals such as bleach (sodium hypochlorite) may be used in order to prevent growth in the system and keep pipes clean (Middleton and Barnhart 2022)." Comment Additional information on the amount of heat transferred into the surrounding waterbody and potential impacts from the "large amount of heat" generated as identified above should be analyzed. Potential impacts of thermal pollution and the direct and indirect impacts to the ecosystem dynamic and sensitive organisms in the pathway of this heat transfer must be evaluated. It is also concerning that there are no quantifiable metrics regarding he cumulative impacts of all offshore substations in the NY Bight Area as well as those planned for Empire Wind (and other planned offshore wind developments) which again are substantially contiguous to OSC-A 0544. There should also be a discussion of the chemicals mentioned above and how that will impact the ecosystem including water quality habitat wildlife etc. which are not sufficiently evaluated in the PEIS.	
BOEM-2024-0001-0313-0021	There is no discussion of the chemical composition of the significant amount of grout that will be used and the impacts to the quality of the water body is leaching and natural degradation occurs. However based on simple publicly available manufacturing specifications from suppliers to other offshore wind turbine grout suppliers it appears that the grout needed would consist of seawater resistant grout material composition and may further include polycarboxylate-based synthetic plasticizers polyglycol-based defoaming agent; calcium sulphur aluminate-based hardener among other chemical additives that may have an impact to benthic organisms and degrade water quality. If any of the byproducts or leached materials could adversely impact the ecosystem dynamic this issue should at least be discussed and/or conditions placed as mitigation measures on the grout utilized. For example in the case of preparing a grout material composition by containing a high strength admixture the following	Potential contaminants other than accidental releases are discussed in Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, under the Presence of structures IPF and Discharges/Intakes IPF. However, the project-specific, COP-level NEPA analysis will provide greater detail for each of the NY Bight lease areas.

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	mechanism is typically generated - the high strength admixture reacts with calcium aluminate among components of cement thereby generating ettringite; the ettringite reacts with a calcium hydroxide generated by a hydration reaction between water and cement thereby forming a calcium silicate hydrate. Further scientific studies have indicated that "The results show that chloride ions induced corrosion of steel bars in offshore RC structures is highly influenced by the concentration of sulfate ions. The sulfate ions induced concrete expansion and cracking from ettringite formation could potentially accelerate chloride ions induced corrosion of steel bars in concrete ultimately the premature failure of the offshore RC structures. (source: Degradation of concrete in marine environment under coupled chloride and sulfate attack: A numerical and experimental study December 2022). Page 2-15 goes on to state "Annual maintenance campaigns are expected to be needed for general upkeep (e.g. bolt tensioning crack and coating inspection safety equipment inspection cleaning high-voltage component service and blade inspection) and replacement of consumable components (e.g. lubrication oil changes). BOEM anticipates OSSs would also undergo annual maintenance to both medium-voltage and high voltage systems auxiliary systems and safety systems as well as topside structural inspections. Portions of the topsides may require the reapplication of corrosion-resistant coating. Routine maintenance and refueling would also be performed on generators located on the OSSs." Comment Building on the comments and concerns above regarding water quality impacts there is no discussion in the PEIS regarding mitigation measures specifically pertaining to water quality impacts of the chemicals proposed and peripherally referenced in these sections. Analysis of hazardous material composition and their potential impacts and mitigation measures if needed are not provided and should be an integral component of the FEIS. Are emerging contaminants such as PFAs or 14 -dioxane used in coatings what is the chemical composition of the specialty cleaning products used and will there be measures to protect the waterbody and dependent organisms from the addition of these chemicals? Anti- fouling paint has an environmental legacy of adverse impacts to the marine ecosystem are these corrosion	

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	resistant coatings safe and the scientific studies substantiating same should be provided as appendices in the PEIS and conditions of these leases. There should also be additional discussion of protection measures for the lubricants and oil in terms of water quality and mitigation measures.	
BOEM-2024-0001-0313-0022	Later in the PEIS there is a paragraph on incidental releases and future planning documents that would be prepared but these standard measures and plans should be provided now for review and comment also these should be part of the proactive planning process not a reactionary measure in case of an incidental release. (page 2-22 "Chemical spills or releases: For offshore activities these include inadvertent releases from refueling vessels spills from routine maintenance activities and any more significant spills as a result of a catastrophic event. All vessels would be certified to conform to vessel O&M protocols designed to minimize risk of fuel spills and leaks. Developers would prepare an Oil Spill Response Plan (OSRP) and would be expected to comply with USCG and BSEE regulations relating to prevention and control of oil spills. Onshore releases could potentially occur from construction equipment or HDD activities. All wastes generated onshore would comply with applicable state and federal regulations including the Resource Conservation and Recovery Act and the Department of Transportation Hazardous Materials regulations.") There are recent news articles expressing concerns about the WTG blades naturally eroding during operation and spreading a significant amount of microplastics as a byproduct. The PEIS should discuss the epoxy compounds shed by WTGs and if they contain toxins that could adversely impact the environment. Microplastic shedding from turbine blades commonly referred to as Leading Edge Erosion has the potential should be evaluated. The particles eroded from blades include epoxy which can be comprised of 40% Bisphenol-A (BPA) a purportedly banned endocrine disruptor and neurotoxin. (See international Journal of Medical Sciences "Int J Med Sci. 2015; 12(12): 926936 Published online 2015 Oct 30; Neurological Effects of Bisphenol A and its Analogues); the abstract of which states "The endocrine disrupting chemical bisphenol A (BPA) is widely used in the production of polycarbonate plastics and epoxy resins. The use	Potential contaminants other than accidental releases are discussed in Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, under the Presence of Structures IPF and Discharges/Intakes IPF. However, the project-specific, COP-level NEPA analysis will provide greater detail for each of the NY Bight lease areas.

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	of BPA-containing products in daily life makes exposure ubiquitous and the potential human health risks of this chemical are a major public health concern. Although numerous in vitro and in vivo studies have been published on the effects of BPA on biological systems there is controversy as to whether ordinary levels of exposure can have adverse effects in humans. However the increasing incidence of developmental disorders is of concern and accumulating evidence indicates that BPA has detrimental effects on neurological development. Other bisphenol analogues used as substitutes for BPA are also suspected of having a broad range of biological actions. The objective of this review is to summarize our current understanding of the neurobiological effects of BPA and its analogues and to discuss preventive strategies from a public health perspective. Academic research has shown the potential for 137 pounds of epoxy microparticles to be shed per turbine per year. The resulting annual BPA release can potentially contaminate water and impact water quality and aquatic and terrestrial life. Minimizing the shedding depends on specialized blade coatings that contain toxic ingredients from the PFAS family of "forever" chemicals which are biologically cumulative and nondegradable. These coatings likewise need replacement after a few years. PFAS is also a common ingredient in lubricants and hydraulic fluids which can leak from wind turbines. The risk of forever impacting the water surrounding nearshore communities and sensitive habitat by wind turbines should be evaluated in the PEIS.	
BOEM-2024-0001-0313-0023	Conversely there are fact sheets and reports from proponents of offshore wind and that attempt to debunk concerns by indicating that any leading edge erosion is minor however this fails to knowledge that potential adverse impacts are measures in parts per trillion so even the smallest amount of erosion especially when considering cumulatively could most certainly have an adverse environmental impact which should be discussed in the PEIS. It is also worthy of note that NYSDEC recently published information on emerging contaminant on aquatic ecosystems which should be included in the evaluation of the PEIS there are significant concerns of bioaccumulation in the food chain of contaminants in the tissues of organisms which again should be discussed in the PEIS. It is	Thank you for your comment. Through the AMMM measures WQ-1 and WQ-2, accidental releases are anticipated to be reduced or minimized. Potential contaminants other than accidental releases are discussed in Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, under the Presence of Structures IPF and Discharges/Intakes IPF. Derivation of bioaccumulation factors and bioaccumulative chemicals of concern are out of scope for this PEIS. The discussions in the PEIS are based on the best available science to date.

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	important that the stated objectives of human and environmental health and safety are evaluated in the PEIS. (see: https://dec.ny.gov/news/press-releases/2023/3/dec-releases-final-ambient-water-quality-guidance-values- for-pfoa-pfos-and-14-dioxane) and the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.4) PROCEDURES FOR DERIVATION OF BIOACCUMULATION FACTORS document. The stated purposed of which is "PURPOSE Bioaccumulation Factors (BAFs) are needed to derive Health (Fish Consumption) and Wildlife type water quality standards and guidance values. BAFs are also used to identify Bioaccumulative Chemicals of Concern (BCCs) in Department programs. The purpose of this document is to provide detailed procedures for the derivation of such BAFs." "The purpose of this document is to describe procedures for deriving bioaccumulation factors (BAFs) to be used in the calculation of Health (Fish Consumption) and Wildlife type standards and guidance values. A subset of the human health BAFs is also used to identify the chemicals that are considered bioaccumulative chemicals of concern (BCCs). B. Bioaccumulation reflects uptake of a substance by aquatic organisms exposed to the substance through all routes (i.e. ambient water and food) as would occur in nature. Bioconcentration reflects uptake of a substance by aquatic organisms exposed to the substance only through the ambient water. Both BAFs and bioconcentration factors (BCFs) are proportionality constants that describe the relationship between the concentration of a substance in aquatic organisms and its concentration in the ambient water. The water quality regulations require BAFs rather than BCFs because they better account for the total exposure of aquatic organisms to chemicals." It is important that the seemingly flippant dismissal of deminimis impacts of microplastics and impacts from epoxy and PFAS/14-dioxane could actually be orders of magnitude more impactful based on the levels of contaminants that are considered by environmental and health agencies to be a serious environmental and human health hazard.	
BOEM-2024-0001-0313-0027	3.1-2 Affected Environment and Environmental Consequences Comment on Table 3.1-1 - Regarding the description for the impact producing factor (IPF) identified as discharges/intakes is incomplete	Thank you for your comment. Corrosion is considered in the Presence of Structures IPF.

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	and should include cleaning chemicals anti-fouling paints any discharge associated with recoating and maintenance. Is the corroded material considered a discharge in this context?	
BOEM-2024-0001-0313-0029	Section 3.4.2 Water Quality includes a discussion of the nature of releases anticipated. Based on Appendix D Table D2-3 up to about 1989065 gallons (7.5 million liters) of coolants 3895547 gallons (14.7 million liters) of oils and lubricants and 1077618 (4.1 million liters) of diesel fuel would be contained in the 737 wind turbine and substation structures for the wind energy projects within the air quality geographic analysis area. If accidental releases occur they would be most likely during construction but could occur during operations and conceptual decommissioning of offshore wind facilities. These may lead to short- term periods (hours to days) of HAPs emissions through surface evaporation. HAPs emissions would consist of VOCs which are important for O3 formation." Comment The staggering number of contaminants that could be accidentally released into the environment requires further analysis and discussion and/or inclusion of the proactive planning documents in the final PEIS to ensure that all reasonable measures are in place and immediate actions are in place prior to any incidental release for the reasons described previously in this comment letter.	Thank you for your comment. Through AMMM measures WQ-1 and WQ-2, accidental releases are anticipated to be reduced or minimized. Please see Section 3.4.2.5.1, *Impacts of One Project*, for a discussion of accidental releases and the potential impacts of the AMMM measures mentioned above.
BOEM-2024-0001-0313-0034	3.4.2 Water Quality The PEIS states "The water quality geographic analysis area as shown on Figure 3.4.2-1 includes a 10- mile (16.1-kilometer) radius around the NY Bight lease areas along with inshore waterways around representative ports that may be used for the NY Bight projects. The offshore geographic analysis area accounts for some transport of water masses due to ocean currents. The inshore geographic analysis area was chosen to capture the extent of the natural network of waterbodies that could be affected by port utilization for construction and operation activities of the NY Bight projects." Screenshot of Figure 3.4.2-1: SEE ORIGINAL COMMENT FOR FIGURE 3.4.2-1: Water quality geographic analysis area Comment The geographic boundary of the water quality impact analysis is woefully inadequate and must be extended to the shoreline to encompass all of the planned components of this project. This is particularly concerning for all of the reasons previously mentioned but some of the most sensitive ecosystems	Since the exact locations and activities for each project are not known at this programmatic stage, the project-specific, COP-level NEPA analysis will include inshore areas for each NY Bight lease area if conditions or activities are different than the analyses of representative areas and projects included in the PEIS.

Comment No.	Comment	Response
	that are dependent on water quality and health of the ecosystem are at the intertidal areas. Further it is unacceptable that water quality analysis does not include the areas proposed for "ocean dumping" and project components that absolutely have the potential to impact water quality. SEE ORIGINAL COMMENT FOR FIGURE 3.6.62- TSS. Separation zones precautionary areas and USCG proposed fairways anchorages and precautionary areas in the geographic analysis area.	
BOEM-2024-0001-0313-0035	Affected Environment and Environmental Consequences 3.4.2-3 The PEIS states "The offshore U.S. waters of the Atlantic Ocean including potential offshore export cable corridors and lease areas have little variation in salinity and temperature though a vertical variation (i.e. stratification) occurs on a seasonal basis (conductivity-temperature-depth data from the World Ocean Database 2021). Stratification typically is strongest in the summer when surface waters are warmer and somewhat less saline than bottom waters; well-mixed and more uniform vertical salinity and temperature profiles are evident in the fall. In late spring and early summer a strong thermocline develops at an approximately 20-meter depth across the entire shelf of the Mid-Atlantic Bight isolating a continuous mid- shelf cold pool of water that extends from Nantucket to Cape Hatteras (Miles et al. 2021). The cold pool holds nutrients over the shelf during the spring and summer which in turn promotes phytoplankton productivity and affects fish distributions and behavior (Lentz 2017; Miles et al. 2021; Nye et al. 2009). The Cold Pool is highly dynamic over its annual lifespan and among years (Chen and Curchitser 2020) experiencing significant changes in stratification with peak stratification occurring in summer and with weaker stratification occurring during its formation and breakdown in spring and fall (Miles et al 2021). Additionally the isolated volume of cold bottom water shifts location predominately moving southwestward along the shelf as it slowly warms through the season (Miles et al. 2021)." The PEIS also states "As one of the key drivers behind water quality change over time climate change (including warming sea temperatures rising sea levels ocean acidification etc.) can affect water quality causing changes and variability within the ecosystem. Northeast regional ocean temperatures have warmed faster than the global ocean over the last two decades according to the National Oceanic and Atmospheric	Thank you for your comment. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures,* which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool.

Comment No.	Comment	Response
	Administration (NOAA 2021). Additionally there is some evidence indicating that the cold pool is both warming and shrinking due to the effects of climate change which will likely affect species distributions and total ecosystem productivity in the Mid-Atlantic Bight (Friedland et al. 2022)." (page 3.4.2-8) Comment There are unanswered questions based on lack of meaningful analysis in the PEIS if the OSSs will impact the ecosystem dynamic especially as it pertains to the converter stations. There are also questions regarding anticipated impact of vertical mixing from WTG installation (pile driving as well as activities associated with installation of appurtenant structures and infrastructure). Further will the construction activity impact the aforementioned thermocline and what will be the impact on the surrounding ecosystem? The short-term and long terms effects of the impacts of the proposed action should be evaluated in the PEIS as it pertains to the thermocline and Cold Pool and potential direct indirect and cumulative impacts of these changes when considering not just the NY Bight but planned offshore wind activities.	
BOEM-2024-0001-0313-0036	Affected Environment and Environmental Consequences 3.4.2-3 Page 3.4.2-3 of the PEIS states "As of 2022 the offshore U.S. waters of the Atlantic Ocean are considered attainable (i.e. meeting water quality standards/goals) per the 303(d) requirements. With increasing distance from shore oceanic circulation patterns play an increasingly larger role in dispersing and diluting anthropogenic contaminants and determining water quality. Waters are assessed as impaired when an applicable water quality standard is not being attained. The top causes of pollution associated with impairment in assessed bays and estuaries are mercury most common in fish tissue; polychlorinated biphenyls (PCBs) persisting in sediments and fish tissue; and pathogens which indicate possible fecal contamination (USEPA 2017). PCBs in sediments among other legacy chemicals (i.e. mercury dichlorodiphenyltrichloroethane and dioxin) potentially exceed water quality standards and can be resuspended in the water column during major storm events or from activities such as dredging." Comment This section raises concerns that are not evaluated in the PEIS regarding potential impacts to ocean circulation patterns as a result of the WTGs and associated	Thank you for your comment. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures,* which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool. Please see Sections 3.4.2.4.1, *Impacts of One Project*, and 3.4.2.4.2, *Impacts of Six Projects*, for discussion on accidental releases, anchoring, cable emplacement and maintenance, and discharges/intakes. AMMM measures, including MUL-1, WQ-1 and WQ-2, and RP MUL-28, address accidental releases of both solid waste and chemicals. AMMM measures MUL-2 and NAV-3 address anchoring plans to avoid sensitive habitats. AMMM measures BEN-1, MUL-41, and OU-4 discuss infrastructure and cable emplacement during siting, construction, operation, and decommissioning phases of the project.

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	structures/infrastructure substantial disturbance and physical barriers in the water. Further this is a case in point example of why the geographic area of water quality analysis must extend to all potentially impacted areas. As the methodology for construction a resuspension of potentially contaminated sediments and suffocating benthic organisms and increasing turbidity are all serious concerns. Accidental releases anchoring cable emplacement and maintenance discharges/intakes points of interconnection all have the potential to substantially contribute to degradation of water quality which should be studied and proactive planning measures and mitigation measures should be discussed in the final PEIS as appropriate. Page 3.4.2-9 indicates that "Additionally global climate change is an ongoing and developing phenomenon in the absence of offshore wind development that causes ocean acidification warming sea temperatures rising sea levels and changes in ocean circulation patterns that can affect water quality." It is important to substantiate in the final PEIS that the proposed action does not cause an unforeseen impact to ocean circulation and water quality impacts than is worse than the no action alternative; which is why this must be evaluated in the final PEIS.	
BOEM-2024-0001-0313-0037	Affected Environment and Environmental Consequences 3.4.2-11 The PEIS states "Using the assumptions in Appendix D Table D2-3 approximately 128184 gallons (485229 liters) of coolants and 842583 gallons (3189524 liters) of fuels oils and lubricants would be involved during construction of the WTGs and OSSs for the Empire Wind 1 and 2 (OCS-0512) projects (the only planned offshore wind projects within the water quality geographic analysis area). Other chemicals including grease paints and sulfur hexafluoride would also be used at the offshore wind projects and black and grey water may be stored in vessels and at onshore facilities. BOEM's study "Environmental Risks Fate and Effects of Chemicals Associated with Wind Turbines on the Atlantic Outer Continental Shelf" presented extensive analysis and modeling to determine the probability and potential environmental consequences of a chemical spill at offshore wind facilities (Bejarano et al. 2013). The modeling effort revealed the most likely type of spill is a non-routine event and could occur from the WTGs at a volume of 90 to 440 gallons (341 to 1666 liters) at a	Thank you for your comment. Through AMMM measures WQ-1 and WQ-2, accidental releases are anticipated to be reduced or minimized. Potential contaminants other than accidental releases are discussed in Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, under the Presence of Structures and Discharges/Intakes IPFs. Sulfur hexafluoride is a gas, poorly soluble in water, and used in WTG switchgears in small quantities (approximately 3 kg). If there is a leak, it is more likely to affect air quality than water quality. Section 2.3 discusses design features of WTGs to accommodate extreme weather, including hurricanes.

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	rate of one time in 1 to 5 years or a diesel fuel spill of up to 2000 gallons (7571 liters) at a rate of one time in 91 years. The likelihood of a spill occurring from multiple WTGs and OSSs at the same time is very low and therefore the potential impacts from a spill larger than 2000 gallons (7571 liters) are largely discountable. BOEM anticipates that the likelihood of a non-routine catastrophic or maximum-case scenario release of all oils and chemicals to be very low (Bejarano et al. 2013). Small-volume spills could occur during OSS transformer maintenance or transfer of fluids (oils and chemicals) while low-probability small- or large-volume spills could occur due to vessel collisions allisions such as a vessel striking against a WTGs/OSS or incidents such as toppling during a storm or earthquake. The use of heavy equipment onshore could result in potential spills during use or refueling activities. Onshore construction and installation activities and associated equipment would involve fuel and lubricating and hydraulic oils." Comment DER reviewed the 5330-page document and while this is in referenced above "Environmental Risks Fate and Effects of Chemicals Associated with Wind Turbines on the Atlantic Outer Continental Shelf" again this does not include evaluation of water quality impacts of emerging contaminants and issues of concern regarding potential contaminants beyond spills and accidental releases. A more comprehensive review of all potential contamination impacts to the water body and organisms must be addressed in the final PEIS. Additionally the risks associated with sulfur hexafluoride seem to be inconsistently evaluated in the PEIS whether it will be utilized or not and thus the evaluation seems disjointed and incomplete. This section further solidifies that validity of the concerns of structural failure during an extreme storm event despite the design for a Category 5 storm there should be a contingency plan in place and evaluation of impacts if WTGs parts thereof and OSSs are destroyed during a storm and the containments and mitigation measures in place.	
BOEM-2024-0001-0313-0038	Affected Environment and Environmental Consequences 3.4.2-12The PEIS states "Cable emplacement and maintenance: The installation of array cables and offshore export cables would include site preparation activities (e.g. boulder removal) cable installation via jetting (primary method) plowing trenching and dredging which can	A statement has been added to the Final PEIS Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative*, to make clear to the reader that a project-specific, COP-level NEPA analysis will provide greater details of the specific NY Bight lease areas in regard to sediment transport models.

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	cause temporary increases in turbidity and sediment resuspension. A sediment transport analysis model was conducted for the only planned offshore wind projects within the geographic analysis area the Empire Wind 1 and 2 projects (OCS-0512) (Tetra Tech 2022). The model showed the displacement of sediments would be low and that sediments would remain suspended for a short period of time (4 hours) and typically dissipate to background levels very close to the trench. The model simulated jet plowing the primary installation method to be used for the Empire Wind projects (OCS-0512). The sediment transport model predicted that the sediment plume would typically travel between 328 feet (100 meters) and 1640 feet (500 meters) during flood and ebb conditions but could travel more than 3280 feet (1000 meters) in some areas with stronger currents. Maximum plume concentrations at 3280 feet (1000 meters) would be below 30 milligrams per liter at all stations with the exception of the two stations with strong currents. Coarse particles (medium sand and larger) would not be suspended in the water column from jet plow activities. Fine sand would settle to the bed in less than 1 minute and within 3 feet (1 meter) to 16 feet (5 meters) of the trench centerline depending on current velocities. Silts and clays would remain suspended for approximately 4 hours and would be transported farther from the trench." Comment Although these models are for Empire Wind it does make sense that similar conditions would be expected for 1 NY bight project but again this does not analyze the cumulative impacts to water quality and benthic organisms marine mammals and the entire ecosystem dynamic for the number of activities ongoing at one time. There could be synergistic and cumulative adverse impacts not only in the short term but also in terms of long-term impacts for smothering of shellfish and larvae as well as dislodging potentially contaminated sediments that would otherwise not be disturbed as a result of the proposed action. These issues should be evaluated and analyzed in the final PEIS.	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Discharges/Intakes* for the discussion of resuspension of contaminants.
BOEM-2024-0001-0313-0039	Affected Environment and Environmental Consequences 3.4.2-13The PEIS states "Offshore wind facilities could have impacts on atmospheric and oceanographic processes (including the cold pool) through the presence of structures and the extraction of energy from	Thank you for your comment. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures,* which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool.

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	the wind. There has been extensive research into characterizing and modeling atmospheric wakes created by wind turbines in order to design the layout of wind facilities and hydrodynamic wake/turbulence related to predicting seabed scour. However relatively few studies have analyzed the hydrodynamic wakes coupled with the interaction of atmospheric wakes with the sea surface. Further even fewer studies have analyzed wakes and their impact on regional scale oceanographic processes (i.e. cold pool) and potential secondary changes to primary production and ecosystems. Studies on this topic have focused on ocean modeling rather than field measurement campaigns." Comment It seems apparent from the information above that there is a lack of scientific studies to understand the impact and long-term effects of a project of this size and scope. In additional to the escrow account required by the developer for decommissioning it appears that there should be funds set aside by the developer for mitigating the potential adverse impacts that may be needed so any long -term remediation and restoration of the habitat is not passed on to the taxpayers in the future.	Lessees can request that facilities remain in place in the decommissioning application submitted to BSEE (30 CFR 285.900-285.913), but BOEM approves or does not approve the request (30 CFR 585.434). Unless otherwise determined during the decommissioning application review, lessees are required to remove all facilities, installations, and other devices permanently or temporarily attached to the seabed on the OCS to a depth of 15 feet below the mudline within 2 years following the termination of a lease or grant. The Energy Policy Act also established specific financial security requirements for OCS projects and requires the lessee to provide a surety bond or other form of financial assurance. Ultimately, the sum of all the lessee's financial assurances will cover the estimated decommissioning costs of an offshore wind farm and, upon termination of the lease, this sum is returned to the lessee or grantee to be used for decommissioning. More information on decommissioning can be found in the following study: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Decommissioning_WhitePaper.pdf.
BOEM-2024-0001-0313-0040	Affected Environment and Environmental Consequences 3.4.2-15 The PEIS States "The exposure of offshore wind structures which are mainly made of steel to the marine environment can result in corrosion without protective measures. Corrosion is a general problem for offshore infrastructures and corrosion protection systems are necessary to maintain their structural integrity. Protective measures for corrosion (e.g. coatings cathodic protection systems) are often in direct contact with seawater and have different potentials for emissions of metals or organic compounds into the marine environment e.g. galvanic anodes emitting metals such as aluminum zinc and indium and organic coatings releasing organic compounds due to weathering or leaching. The current understanding of chemical emissions for offshore wind structures is that emissions appear to be low suggesting a low environmental impact especially compared to other offshore activities; however these emissions may become more relevant for the marine environment with increased numbers of offshore wind projects and a better understanding of the potential long-term effects of	Additional text has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures*. Additional sources—including findings from a study of sacrificial anodes (Reese et al. 2020) and further discussion of HDVC cooling systems (Middleton and Barnhart 2022)—have been included. In addition, AMMM measure WQ-1 details the mitigation measurement designed to address sacrificial anodes, and AMMM measure WQ-2 details a 17-step plan to address accidental spills.

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	corrosion protection systems (Kirchgeorg et al. 2018). Based on the current understanding of offshore wind structure corrosion effects on water quality BOEM anticipates the potential impact to be minor. The presence of structures would not be expected to appreciably contribute to the cumulative impacts on water quality." Comment To build on previous comments and concerns expressed in this letter the potential impacts to water quality are seemingly summarily dismissed without substantiation. In the above paragraph not only are concerns raised about the impacts to water quality from corrosion but also the typing of chemicals that are used in coatings which may themselves be comprised of materials that could leach into the waterbody and affect the water quality and supported marine life. It does not appear that there is meaningful and comprehensive evaluation of all potential contamination that could contribute to impairing the water body to arrive at the conclusion below especially when considering not just this project but all planned and future offshore wind projects. Suggestions of no impact are not an acceptable substitute to definitive research on this topic which again should also analyze not just this project and the other planned projects but also any synergistic effects of how these chemicals interact in the waterbody bioaccumulating factors and mitigation measures to minimize any impacts to the ecosystem.	
BOEM-2024-0001-0313-0046	Affected Environment and Environmental Consequences 3.5.2-15The PEIS states "Discharges/intakes: Increase in discharge and intake would be expected due to an increase in vessel activity within the NY Bight area waters and ports. Permitted offshore discharges would include uncontaminated bilge water ballast grey water and treated liquid wastes. It is generally expected that maritime activity including offshore development recreation and shipping would increase in the foreseeable future. Water intake can occur through planned activities such as cooling systems for power plants or other energy sources which is the case for the Sunrise Wind Farm (Woods Hole Group 2021; Middleton and Barnhart 2022). Intake of smaller volumes can also occur with some cable trenching methods. This water intake increases the likelihood of entrainment and impingement of planktonic organisms (Barnthouse 2013; Heimbuch 2007). Intake and physical contact with a barrier (screen) due to high	CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Discharges/Intakes,* which discusses the minimal impacts of the open loop cooling system. The project-specific COP-level NEPA analysis will also provide greater details.

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	intake velocity can negatively impact larval benthic invertebrates and larval fish (Barnthouse 2013; Heimbuch 2007). Benthic larvae and other planktonic organisms would experience unavoidable mortality within a small range of the activity. " Comment DER disagrees with the characterization of this activity and impact as small in general given the scope scale and magnitude of the proposed action and cumulative impacts there is relatively little if anything about this project that should be considered small. Further any unavoidable mortality should be quantified with a commensurate impact to water quality as previously discussed as well as environmental impacts to the trophic levels and subsequent environmental impact to the ecosystem as a result of the proposed action.	
BOEM-2024-0001-0313-0056	Again DER would also like to reiterate the necessity for extending the water quality geographic boundary to include this area and sphere of potential impact influence in the PEIS analysis. Are other planned developments utilizing these same disposal sites what is the cumulative impact and amount of sediment planned for disposal?	Since the exact locations and activities for each project are not known at this programmatic stage, the project-specific, COP-level NEPA analysis will include proposed disposal sites for each NY Bight lease area if the project is proposing sediment disposal.
BOEM-2024-0001-0331-0009	"Few studies have been done to understand hydrodynamics around wind energy turbines and those that exist focus on European offshore wind farms in the North Sea where conditions are different from Nantucket Shoals. Large turbines of the size planned for the Nantucket Shoals region have not been built yet in U.S. waters. Researchers have tried to model the hydrodynamic impacts of turbines but their results don't always agree with each other. There's a need for more work to compare different types of models with each other and with actual observations in the ocean to make sure that they represent key processes like tides stratification turbulence and drag correctly. The most accurate outputs will likely come from using a range of models. Oceanographers might start with models that predict what happens as water moves past a single turbine. These results then would inform models that predict the effects of an entire wind farm. Then results from wind farm- scale models would be incorporated into models that predict regional ocean circulation.	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures* for the discussion on hydrodynamics. The project-specific COP-level NEPA analysis will provide further details specific to the NY Bight lease areas.
BOEM-2024-0001-0331-0038	The PEIS ignores the Deoxygenation Potential of Offshore Wind Areas. Offshore wind projects have the potential to increase sediment carbon in deeper areas of the ocean due to reduced	Thank you for your comment. Caution should be taken in extrapolating study outcomes from European wind farms to expected results in the NY Bight, as the environmental conditions

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	current velocities and negatively impact decreased dissolved oxygen within areas that currently have low oxygen concentration. In European wind farm areas there is evidence that ongoing offshore wind farm developments can have a substantial impact on the structuring of coastal marine ecosystems on basin scales. Recently Floeter et al. (Floeter J. et al. Pelagic effects of offshore wind farm foundations in the strati!ed North Sea. Prog. Oceanogr. 156 154173 (2017). provided empirical evidence for the existence of these upwelling/down-welling dipoles showing distinct structural changes in mixed layer depth and potential energy anomaly inside the wind wake area of OWFs in the summer stratified area of the southern North Sea. (Floeter J. et al. Pelagic effects of offshore wind farm foundations in the stratified North Sea. Prog. Oceanogr. 156 154173 2017) including ? An increase in sediment carbon due to the reduced velocities in the water columns and? An Increase in dissolved oxygen in the pelagic and benthic region. A first assessment of the large-scale integrated impact of atmospheric wakes from already existing OWFs on the hydrography of the southern North Sea revealed the emergence of large-scale oceanic structures with respect to currents sea surface elevation and stratification. Daewal et al. (2022) (Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Ute Daewel et al. 2022. 3:292. https://doi.org/10.1038/s43247-022-006250 www.nature.com/commsenv studied the impacts of primary production and bottom water deoxygenation in the North Sea. The researchers examined modifications in mixing and stratification in relation to impacts with nutrient availability in the euphotic zone. Their concerns examined the ecosystem impacts for some obvious reasons: (i) Changes in nutrient concentration would start a cause-effect chain that translates into changes in primary production and effectively alters the food chain; (ii) In a dynamic system like the southern North Sea which is characterized by strong tidal and residual currents changes in the biotic and abiotic environment are exposed to advective processes; (iii) The expected changes depend strongly on the prevailing hydrodynamic conditions which makes it	are not equal. European wind farm facilities differ as they are in shallower waters with weak seasonal stratification, in sheltered areas along the coasts, and are arranged with tight spacing of turbines (Lentz 2017; Hogan et al. 2023). Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures*, which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool.

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	difficult to disentangle natural from inflicted changes. Other than a high-density suite of physical and biological observations numerical modeling studies are the only means to build BACI studies as scenarios with and without the disturbance can be simulated.	
BOEM-2024-0001-0331-0040	The PEIS Incorrectly Dismisses Impact to Cold Pool The PEIS dismisses as an alternative to minimize an important factor impacting marine habitats and migratory patterns on the midAtlantic shelf called the “Cold Pool”. This seasonal thermocline is one of the largest of its kind in the global ocean and extends from Nantucket to Cape Hatteras. Wind turbines have been shown to impact the mixing of ocean water both at the surface through their change in wind energy and at other levels through their physical structure. The PEIS on table 2-3 makes passing mention of the mid Atlantic cold pool but subsequently in the no action or the action alternatives does not present or any assessment of the impacts on it. This is a glaring omission the PEIS. The PEIS needs to provide a full assessment of the impact to the cold pool not just from this project but from all reasonably foreseeable actions including its own wind project approvals between the Hudson Shelf valley and Cape May NJ. Beyond that the impact on the Cold Pool both off the New Jersey coast and more broadly off the mid-Atlantic shelf from this project and in conjunction with the other foreseeable offshore wind projects must be carefully assessed. As mentioned in the July 22 2020 report of the Science Center for Marine Fisheries Management (a project funded by the National Science Foundation) in its critique of the BOEM Supplementary Environmental Impact Statement for the Vineyard Wind Project: “Too much attention cannot be given to the Cold Pool” and “The weakening of the Cold Pool supports the potential of generating the most catastrophic ecological event on the continental shelf the world has ever seen”. On page 3.4.2-13 of the PEIS BOEM states that offshore wind facilities could have impacts on the cold pool and admits that relatively few studies have analyzed the hydrodynamic wakes coupled with the interaction of atmospheric wakes with the sea surface. Further even fewer studies have analyzed wakes and their impact on regional scale and oceanographic process (cold pool). On page 3.5.2-29 BOEM states that few studies have evaluated the secondary impacts of atmospheric wakes the interaction with the	Thank you for your comment. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures,* which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool. Additional text was added in the hydrodynamics discussion.

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	sea surface and the regional changes of oceanographic patterns (cold pool) and primary productivity. On page 3.5.6-49 BOEM states that changes in the cold pool dynamics resulting from future activities should they occur could conceivably result in changes in habitat suitability and fish community structure but the extend and significance of these potential effects are unknown. The potential impact of cumulative impact of the Atlantic Coast offshore wind projects including the New York Bight on the Cold Pool should be clearly understood before this or any new projects are permitted.	
BOEM-2024-0001-0331-0041	The PEIS Does Not Adequately Address the Potential Impact of Offshore Wind Projects on Freshwater Aquifer Shoreline Sinking and Potential Catastrophic Offshore Landslides. A Rutgers study on the impact of climate change (New Jersey's Rising Seas and Changing Coastal Storms: Report of the 2019 Science and Technical Advisory Panel Kopp et al 2019) identifies two major components to rising sea levels at the NJ shore global warming and the sinking shoreline. Contributors to the sinking shoreline include "glacial isostatic adjustment" (GIA) which is tied to the fresh water aquifers that underlie the continental shelf and sediment compaction which is due to increasing weight on the developed land. Another study shows the connection between the onshore aquifers and the huge deep freshwater aquifer that extends out to the edge of the continental shelf (Aquifer Systems Far Offshore on the US Atlantic Margin Gustafson et al Scientific Reports 9 article 8709 2019).	Thank you for your comment. The project-specific, COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0331-0042	And a study (Overpressure and Fluid Flow in the New Jersey Continental Slope: Implications for Slope Failure and Cold Seeps authored by Dugan and Flemings and published by in Science July 14 2000) documents the instability in the NJ seabed above the deep aquifer. That study was reported in Science News July 25 2000 under the title Trapped Water Could be a Cause for Underwater Landslides Tidal Waves. The PEIS on page 3.4.2-7 states that "groundwater reservoirs underlie areas where onshore project activities could occur. Some of these reservoirs provide water supplies to communities including USEPA-designated sole source aquifers which are aquifers that supply at least 50-percent of the drinking water for an area with no other sources available if the aquifer is contaminated. Sole-source aquifers that overlap areas where	Thank you for your comment. The project-specific, COP-level NEPA analysis will provide further details specific to the NY Bight lease areas. Through AMMM measures WQ-1 and WQ-2, accidental releases are anticipated to be reduced or minimized. Please see Section 3.4.2.5.1, *Impacts of One Project,* for a discussion of accidental releases and the potential impacts of the AMMM measures mentioned above. Empire Wind (OCS-0512) is the only ongoing offshore wind project in the offshore geographic analysis area.

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	onshore project activities may occur include the New Jersey Coastal Plains aquifer system Kings/Queens Counties (Brooklyn- Queens) aquifer system and the Nassau/Suffolk Counties Long Island aquifer system. On page 3.4.2-18 BOEM states that impacts from accidental releases on water quality would result in negligible and temporary impact on surface and groundwater quality including sole source aquifers." Therefore the PEIS does not adequately address this very significant issue. BOEM in other EIS documents has stated that "Very few studies have examined the effects of substrate vibration from pile driving yet many have acknowledged that is a field of urgently needed research". Nor has there been a programmatic analysis done of the multiple projects planned off the northeast Atlantic coast to evaluate the combined potential impact on the unstable ocean floor from these massive industrial developments.	
BOEM-2024-0001-0331-0043	Atlantic Coast projects contemplate 1800+ massive 900-1300 ft tall turbines as close as 9 miles to the NJ shore which will likely have monopole bases that are each 15 meters in diameter and each weigh 2500 tons (5 million pounds). They will be pile driven up to 242 feet into the seabed with repeated hammer strokes each up to 4400 kilojoules. And these giant turbines will generate significant continuous low frequency operating vibrations that will be transmitted into the ocean floor for their entire multi - decade operating life. The public needs assurance that these massive projects will not impact our fresh water aquifers that they will not exacerbate the current sinking of the NJ shore line related to the changing pressure dynamics of the underground aquifers and that they will not trigger underwater landslides in the unstable continental shelf. Therefore this subject requires much more analysis in the PEIS and future EIS documents.	Please see the Land Disturbance discussion in Section 3.4.2.4.1, *Impacts of One Project*. The project-specific, COP-level NEPA analysis will provide further details specific to the NY Bight lease areas. Proper erosion and sedimentation controls would be maintained to prevent soil destabilization and water quality impacts during construction, protecting groundwater resources, including sole source aquifers, and minimizing land disturbance near shorelines through the use of HDD at landfall sites.
BOEM-2024-0001-0332-0012	Discharges/Intakes With regards to discharges/intakes (3.5.2-24) routine vessel discharges even within USCG regulations brings a hot topic of invasive species to the forefront. OSSs with open loop cooling systems must be prohibited due to thermal plume warming waters and loss of fish larvae. This could hurt recruitment and jeopardize the sustainability of some fisheries. The NYB the waters and substrate necessary for spawning feeding and growth to maturity. In New Jersey PSEG continues to pay compensatory	Section 3.5.5, *Finfish, Invertebrates, and EFH,* and Section 3.5.2, *Benthic Resources,* provide analysis of entrainment and impingement. Section 316(b) of the CWA requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impact from impingement and entrainment of aquatic organisms. If a project

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	mitigation for the fish eggs/larvae entrained/impinged through the open loop cooling system at the Salem nuke plant. That money goes towards a host of programs that seek to offset the impact of that mortality. Given the fact that we know many important species fluke and BFT being just two spawn in those waters or where their larvae are present in waters where AC/DC substations would be needed BOEM must calculate mortality and execute an agreement to outline a plan to mitigate the impact. A mitigation fund must be set up prior to construction with payments into the fund based on the economic cost associated with their entrainment/impingement. Cold Pool Disruption. The NYB's unique cold bottom waters support our diverse fisheries and must be protected. The use of "few studies" and "fewer studies" in Section 3.4.2-13 screams stop and get the scientific work done before proceeding. "The new presence of structures and their impact on regional scale oceanographic processes and potential secondary changes to primary production and ecosystems is extremely important. Structures may reduce wind-forced mixing of surface waters whereas water flowing around the foundations may increase vertical mixing." "There has been extensive research into characterizing and modeling atmospheric wakes created by wind turbines in order to design the layout of wind facilities." Obviously their investment depends on it. Why isn't this same attention and resources dedicated to hydrodynamics?	is proposing open loop systems, the project-specific COP-level NEPA analysis can be expanded and mitigation proposed. Section 3.5.5, *Finfish, Invertebrates, and EFH,* and Section 3.5.2, *Benthic Resources,* provide analysis of hydrodynamic effects and the Mid-Atlantic Bight Cold Pool.
BOEM-2024-0001-0334-0003	Though your reviewers are adept at identifying numerous issues with the construction of offshore wind projects there are no tough stances to ensure that these issues are indeed mitigated. The result appears to be the overlooking of potential dangers. In your past two New Jersey EIS efforts the documents contain numerous MAJOR category impacts. Ocean Wind 1 FEIS contains 770 instances of the word "MAJOR" and Atlantic Shores 1 contains 366 instances. Spot-checking these instances in the PDF view reveals that most are material references to important impacts not just incidental use of the word "major. SEE ORIGINAL COMMENT FOR IMAGES OF Filed Drive of Ocean Wind 1 Offshore Wind Farm Final Environmental Impact Statement May 2023 BOEM has ignored the risks associated with the fluids and chemicals/gases (SF6) contained in offshore installations. The infographic below calculates all of the industrial	Thank you for your comment. Through AMMM measures WQ-1 and WQ-2, accidental releases are anticipated to be reduced or minimized. Please see Section 3.4.2.5.1, *Impacts of One Project*. Sulfur hexafluoride is a gas, poorly soluble in water, and used in WTG switchgears in small quantities (approximately 3 kg). If there is a leak, it is more likely to affect air quality than water quality.

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	fluids in the current U.S. offshore plans. Prior estimates for just the New Jersey 7500MW plan and 1100MW plan are 25 million gallons/2.5 million pounds of SF6 and 35 million gallons/5 million pounds of SF6 respectively. Creating such a risk which could become a nightmare on the East Coast in catastrophic storms or acts of war should be avoided. Relatedly the plans that would be implemented in the case of catastrophic spills are classified and therefore cannot be judged by the public. The public should know the completeness of the cleanup plans. SEE ORIGINAL COMMENT FOR The U.S. Plan for 86Gw of Off Shore Wind SEE ORIGINAL COMMENT FOR TABLE: Hazardous Material Risks with U.S. 2050 Offshore Wind Industrialization	
BOEM-2024-0001-0334-0006	Wrecking of marine habitat through increasing water temperature: We expect all further analyses to model increases in water temperature due to the blocking of normal water churning by the undersea installations. Furthermore for the farms further out we understand that the HVDC cooling installations will intake 8 million gallons a day of cool seawater and output that water at temperatures exceeding 90F. The creatures living in the vicinity of these installations will not survive these temperature increases. The ripple effect on the chain of life will be devastating. These behaviors contradict the assertion that offshore wind helps global climate issues. In fact it appears that they will gravely exacerbate problems. SEE ORIGINAL COMMENT FOR IMAGE: Bringing Renewable Energy to About 1.2 Million Homes and Supporting the UK Governments Strategy to Meet New Zero Greenhouse Emissions by 2050	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures* for the discussion of hydrodynamics and discharges/intake for the HVDC cooling water intake.
BOEM-2024-0001-0334-0007	Poisoning of the fish in the vicinity: You do not forbid the use of sacrificial anodes as a method of protecting the undersea steel structures. So the builders will use them as the cheapest solution. We aren't supposed to use hot water from hot water tank heaters in our homes for cooking due to the sacrificial anodes contained within as they leach heavy metals into the water making it unsafe to consume. Sacrificial anodes have been used on oil rigs and boats for a long time. There has already been sensing of the heavy metal content in the North Sea from sacrificial anodes. Now New Jersey the East Coast and all of the coastal US have plans to fill the near-shore	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures* for discussion on the sacrificial anodes. Additional text has been added. Please see Section 3.4.2.5, *Impacts of Alternative C (Proposed Action) – Identification of AMMM Measures at the Programmatic Stage,* for further information on WQ-1, which requires lessees to avoid using zinc sacrificial anodes.

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	waters with an explosion of structures likely using sacrificial anodes - significantly increasing the concentration of leached heavy metals.	
BOEM-2024-0001-0355-0018	My main concerns are: Contamination of our state's water resources. What are the components of the cables and their sheathing composed of and will there be a chance for any contamination of materials from these cables and sheathing or digging the trenches into our water supply?	Thank you for your comment. This will be included in the project-specific, COP-level NEPA analysis.
BOEM-2024-0001-0355-0048	The HVDC high voltage direct current converter station with required environmental containment walls is still a gamble on the Kirkwood-Cohansey aquifer which in case of a catastrophic accident could affect the drinking water in a high percentage of Jersey and all the home values along the 12.5-mile route of the cables. Once this large aquifer is compromised it will be a disaster for the State of New Jersey.	Thank you for your comment.
BOEM-2024-0001-0357-0056	Enclosure VI The Cold Pool Cumulative Impact An important factor impacting marine habitats and migratory patterns on the mid-Atlantic shelf is the "Cold Pool". This seasonal thermocline is one of the largest of its kind in the global ocean and extends from Nantucket to Cape Hatteras. Wind turbines have been shown to impact the mixing of ocean water both at the surface through their change in wind energy and at other levels through their physical structure. The Atlantic Shores draft EIS on page 3.5.54 makes passing mention of the mid Atlantic cold pool but subsequently in the no action or the action alternatives does not present or any assessment of the impacts on it. This is a glaring omission the DEIS. The Call pool with the impacted by all the projects off New Jersey and New York. Therefore this program EIS needs to provide a full assessment of the impact to the cold pool not just from this project but from all reasonably foreseeable actions including its own wind project approvals between the Hudson Shelf valley and Cape May NJ. Beyond that the impact on the Cold Pool both off the New Jersey coast and more broadly off the mid-Atlantic shelf from this project and in conjunction with the other foreseeable offshore wind projects must be carefully assessed. As mentioned in the July 22 2020 report of the Science Center for Marine Fisheries Management (a project funded by the National Science Foundation) in its critique of the BOEM Supplementary Environmental Impact Statement for the	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures* for the discussion on hydrodynamics, including the Mid-Atlantic Bight Cold Pool.

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	Vineyard Wind Project: "Too much attention cannot be given to the Cold Pool" and "The weakening of the Cold Pool supports the potential of generating the most catastrophic ecological event on the continental shelf the world has ever seen". The potential impact of this and other such wind projects on the Cold Pool should be clearly understood before this or any new projects are permitted.	
BOEM-2024-0001-0362-0021	BOEM should detail information related to air and water quality impacts in the region associated with potential manufacturing port activities construction and ongoing operations and maintenance.	Section 3.4.2.3.2 provides an assessment of the impacts on water quality from port utilization and possible port improvements. Port improvement projects are described in Appendix D, Section D.2.5. If the individual projects include other port improvement components, the project-specific COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0469-0012	The seafloor is an important reserve for natural carbon storage known as "blue carbon" in coastal and marine environments. NOAA's early research in Marine Protected Areas ("MPA") show the critical role this environment plays in sequestering carbon though fewer studies have been conducted in non-MPAs. [Footnote 32: Sara Hutto et al Mud Matters: Understanding the Role of Ocean Sediment in Carbon Sequestration OPEN COMMC'NS FOR THE OCEAN (Feb. 13 2024) https://octogroup.org/mud-matters-understanding-the-role-of-ocean- sediments-in-storing-carbon/] Industrial development that disturbs the seafloor can displace the stored carbon which can then remineralize into aqueous carbon dioxide in the ocean. [Footnote 33: Id.; Knut Heinatz & Maike Scheffold A First Estimate of Offshore Wind Farms on Sedimentary Organic Carbon Stocks in the Southern North Sea 9 FRONTIERS IN MARINE SCI. (Jan. 16 2023) https://doi.org/10.3389/fmars.2022.1068967] Although the Draft PEIS highlights that climate change threatens the ocean's function as a carbon sink it does not compare the risk of carbon resuspension from seafloor disturbance especially accounting for BOEM's earlier projection that OSW projects in the United States are unlikely to significantly affect the global climate on their own. [Footnote 34: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5; BUREAU OF OCEAN ENERGY MGMT. VINEYARD WIND OFFSHORE WIND FARM FINAL ENVIRONMENTAL IMPACT STATEMENT vol. 2 at A-51 (March 2021)	The project-specific COP-level NEPA analysis will provide further details on sediment resuspension specific to the NY Bight lease areas.

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	https://www.boem.gov/sites/default/files/documents/renewable-energy/state- activities/Vineyard-Wind-1-FEIS-Volume-2.pdf]	
BOEM-2024-0001-0469-0015	Oceanographic Conditions The Mid-Atlantic cold pool is a seasonal temperature and nutrient stratification cycle that allows cold-water creatures to thrive in the North Atlantic. It results in cold water remaining trapped just above the seafloor so animals that prefer colder climates can remain further south than they otherwise would especially shellfish and the organisms that depend on them. [Footnote 44: See Travis Miles et al Could federal wind farms influence continental shelf oceanography and alter associated ecological processes? A literature review SCI. CTR. FOR MARINE FISHERIES & RUTGERS SCH. ENV'T & BIOLOGICAL SCIS. at 2-3 (Dec. 2020) https://scemfis.org/wp-content/uploads/2021/01/ColdPoolReview.pdf] In the Mid-Atlantic Bight ("MAB") "over 2 million acres of the continental shelf have been leased for offshore wind energy projects that are under development including sites that overlap with the seasonal Cold Pool". [Footnote 45: Rebecca Horowitz et al Overlap Between the Mid-Atlantic bight Cold Pool and Offshore Wind Lease Areas ICES J. MARINE SCIS. at 1 (2023) https://academic.oup.com/icesjms/advance-article/doi/10.1093/icesjms/fsad190/7462579]Many OSW studies were conducted in the North Sea because Europe already has industrial OSW installations to study. [Footnote 46: Miles et al supra note 45 at 1.] However the North Sea's cold pool is not as stratified as the Mid-Atlantic Cold Pool so the results are more representative of OSW impacts when the Cold Pool is not as stratified such as in the spring and fall. [Footnote 47: Id.] Additionally "many European lease areas use smaller capacity turbines with different spacing further adding to uncertainty about how relevant prior research is to MAB conditions". [Footnote 48: Horowitz et al supra note 46 at 2.]OSW installations could potentially change the patterns of the Cold Pool due to the structures themselves and the extraction of wind changing the naturally occurring current. [Footnote 49: Miles et al supra note 45 at 10.] "Turbines can disturb downwind wind fields by decreasing wind speed and increasing turbulence". [Footnote 50: L. Bennun et al supra note 42.] This is known as the "wind wake effect"	Thank you for your comment. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of structures,* which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool.

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	and it can cause both upwelling and downwelling changing the distribution of temperature and nutrients "potentially affecting an area 10-20 times larger than the wind farm itself with possible knock-on ecosystem effects." [Footnote 51: Id.; see also Ute Daewel et al Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea 3 COMMS. EARTH & ENV'T (Nov. 24 2022) https://doi.org/10.1038/s43247-022- 00625-0 (Wind wake effects can increase or decrease zooplankton productivity by up to 10%)]Moreover it is unclear if the research conducted to date fully assessed and evaluated the impacts of the high-temperature discharge from the many once-through cooling systems (discussed in Section V) planned not only for the six New York Bight lease areas but for other projects in the area. As COA outlined in our comments on the Notice of Intent to Prepare the Draft PEIS the sea surface microlayer contains distinct microbial habitats and is central to a range of global biogeochemical and climate-related processes. [Footnote 52: Oliver Wurl et al Sea Surface Microlayer in a Changing Ocean A Perspective ELEMENTA: SCI. OF THE ANTHROPOCENE (2017) https://doi.org/10.1525/elementa.228] BOEM acknowledged receiving COA's concerns about potential effects of offshore wind on the sea surface microlayer in COA's comments on the Notice of Intent to prepare the Draft PEIS. However BOEM did not provide a response to COA's comment discuss the role of the microlayer analyze the sea surface microlayer or provide a reason why they would not do so nor how the microlayer will be assessed and protected. [Footnote 53: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 appx. O at O-46.]The Cold Pool is an essential phenomenon for the survival of the Mid Atlantic ecosystem. The PEIS must not be finalized without a multi-year assessment study of the Cold Pool with independent scientific assessment.	
BOEM-2024-0001-0469-0016	Once-Through Cooling There is no detailed research on the projected impacts of once-through cooling systems in the six New York Bight OSW lease areas as those impacts will be evaluated during the COP NEPA review according to BOEM staff. Projects in the six Draft PEIS lease areas will likely use once- through cooling systems as it is	Thank you for your comment. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts.

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	currently the only economically feasible method of cooling HVDC systems. [Footnote 54: BUREAU OF OCEAN ENERGY MGMT. SUPPORTING NATIONAL ENVIRONMENTAL POLICY ACT DOCUMENTATION FOR OFFSHORE WIND ENERGY DEVELOPMENT RELATED TO HIGH VOLTAGE DIRECT CURRENT COOLING SYSTEMS 5 (Apr. 2022) https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/HVDC%20Cooling%20Systems%20White%20Paper.pdf] AC power does not travel well via undersea cables further than thirty miles offshore so projects sited further from shore must convert AC to DC through an HVDC substation which requires a cooling system and produces higher electromagnetic fields which could affect electrosensitive species. [Footnote 55: Id. at 1.] The once-through cooling process involves pumping in cool ocean water; filtering small particles sand and other elements smaller than 500 microns; impinging and entraining organisms within said water; adding biocides such as sodium hypochlorite to prevent growth in the system at 10-200 parts per million; and discharging heated treated water back into the ocean. [Footnote 56: Id. at 2.]Generally without citing to any specific source BOEM writes: "The warm water discharged is generally considered to have a minimal effect as it will be absorbed by the surrounding water and returned to ambient temperatures. Entrainment of potential prey resources would be minimal given the small number of [offshore substations] proposed per project. Entrainment of marine mammals that may depredate on entrained prey is discounted due to physical impedance by intake safety screens." [Footnote 57: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 3.5.6-29.]COA opposes the use of once-through cooling systems in all industries as they have significant adverse impacts on marine ecosystems. [Footnote 58: CLEAN OCEAN ACTION POSITION PAPER ON OYSTER CREEK NUCLEAR GENERATION STATION'S COOLING WATER SYSTEM (2010) (on file with COA).] Studies conducted on once-through cooling system discharges from other power plants have shown that these discharges are several degrees warmer than surface temperature of the receiving waterbody(ies) and are	The project-specific COP-level NEPA analysis will provide further details.

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	detrimental to marine communities and fish populations. Coastal power plants with once through cooling systems have been found to entrain and impinge millions of fish and larvae within the space of two years. [Footnote 59: URS CORP. NORMANDEAU ASSOCIATES INC. CHARACTERIZATION OF THE AQUATIC RESOURCES AND IMPINGEMENT AND ENTRAINMENT AT OYSTER CREEK NUCLEAR GENERATING STATION Tables 6-9 (Sept. 2008);] Once-through cooling systems significantly change the bacterioplankton community. [Footnote 60: Meora Rajeev et al Thermal discharge-induced seawater warming alters richness community composition and interactions of bacterioplankton assemblages in a coastal ecosystem SCI. REPORTS (Aug. 30 2021) https://www.nature.com/articles/s41598-021-96969-2; Jebarathnam Prince Prakash Jebakumar et al Impact of a Coastal Power Plant Cooling System on Planktonic Diversity of a Polluted Creek System 133 MARINE POLLUTION BULLETIN 378 (Aug. 2018) https://doi.org/10.1016/j.marpolbul.2018.05.053] In one study phytoplankton population density decreased by 64% zooplankton density decreased by 93% and loss of fish larvae impacted local fisheries. [Footnote 61: Jebarathnam Prince Prakash Jebakumar et al supra note 60.] Species that prefer warmer water such as sea turtles may be attracted to the warm water surrounding the outflow area which can change the composition of the marine community. Marine life that become habituated to the warmer temperature can be killed from thermal shock in the event of a planned or emergency shutdown of the cooling system. [Footnote 62: See Oyster Creek Nuclear Generating Station Fish Kill Monitoring Report (January 2000) NRC ML#003684420; Oyster Creek 2001 Annual Environmental Operating Report (February 2002) NRC ML#020660222; A. Cradic Oyster Creek Generating Station fined for water violations and fish kills: DEP seeks compensation for Natural Resources Damages New Jersey Department of Environmental Protection news release (December 12 2002) available for viewing at http://www.state.nj.us/dep/newsrel/releases/02_0131.htm] There has never been a study in the North Atlantic offshore environment to determine what species would be impacted by once-through cooling systems through impingement or entrainment; such a study should	

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	be conducted before large-scale once-through cooling systems are built in the New York Bight lease areas. According to the PEIS specific cooling systems will be chosen and evaluated during the individual environmental review of each project's COP and other agencies are responsible for ensuring compliance with pollution discharge requirements including thermal pollution. [Footnote 63: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 3.1-2.] However this is not possible until a thorough study of the impacts of once-through cooling systems is conducted. Then with NMFS BOEM needs to incorporate more parameters related to once- through cooling in the project design envelope such as ranges for the amount of water that would be pumped through amount of biocides that would be discharged and effects on local water temperature. Additionally BOEM must reconsider its characterization of once-through cooling as having minor impacts especially as there is no scientific basis for this determination.	
BOEM-2024-0001-0474-0005	Among other reasons the action is Arbitrary because the proposed action fails to properly consider that the offshore wind projects and development of leasehold interests impair the integrity of the ocean to the detriment of citizen stakeholders and the public.	Thank you for your comment. Please see Sections 3.4.2.4.1, *Impacts of One Project,* and 3.4.2.4.2, *Impacts of Six Projects,* for the impact analysis on water quality.
BOEM-2024-0001-0474-0009	Among other reasons the action is Arbitrary because the proposed action fails to prioritize the role of the ocean in tempering climate change and evaluate assess and mitigate the negative impact of the proposed offshore wind development on the ocean. Among other reasons the action is Arbitrary because the proposed action fails to recognize and evaluate the role of the ocean in the entire scheme of biodiversity and fails to evaluate assess and mitigate the negative impact of the proposed offshore wind development.	Thank you for your comment. Please see Sections 3.4.2.4.1, *Impacts of One Project*, and 3.4.2.4.2. *Impacts of Six Projects*, for the impact analysis on water quality.
BOEM-2024-0001-0530c	I want to know what's going to happen to the New York cold Bight area, when you've already said through your paperwork and your studies that these wind farms are going to do little to nothing to mitigate carbon footprint issues, to reduce carbon emissions, to combat global warming. On top of that, you already stated too that these windmills are going to have a dampening effect and that the winds are no longer going to cool the surface temperatures of the seas like they used to. On top of that you're also placing numerous	Please refer to response to comment BOEM-2024-0001-0528c for more information on impacts from offshore wind projects on GHG emissions. Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. Please also see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Presence of Structures,* which

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	substations in our cold bight area that are going to be constantly pumping out 90-degree water to increase the surface temperature. Has anybody considered how important the New York Bight cold bight is to global warming and what it does to cool down the Gulf Stream before it reaches the Arctic Circle.?	discusses hydrodynamics, including the Mid-Atlantic Bight Cold Pool. A discussion of the potential impacts of cooling system discharge and intake on finfish, invertebrates, and EFH is provided in Section 3.5.5.3.3. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0528r	We know from studies of existing wind farms that both increases and decreases in phytoplankton and other plankton productivity are observed around wind turbines, essentially cancelling each other out over the whole region. But opponents of offshore wind often cite the 2022 paper by Daewal and colleagues in the North Sea of Europe as reason for concern, but conveniently ignore their finding of a 12% increase in zooplankton biomass in the presence of wind turbines. The PEIS itself cites a 2020 paper by Dannheim and colleagues which found increased primary productivity at local scales around wind turbines.	Thank you for your comment. Potential impacts from offshore wind activities on primary productivity are discussed in Section 3.5.2.4. Caution should be taken in extrapolating study outcomes from European wind farms to expected results in the NY Bight, as the environmental conditions are not equal. European wind farm facilities are in shallower waters with weak seasonal stratification, are in sheltered areas along the coasts, and are arranged with tight spacing of turbines (Lentz 2017; Hogan et al. 2023). Please also see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Presence of Structures*, which discusses hydrodynamic impacts in greater detail.
BOEM-2024-0001-0528z	Placement of converter stations and the use of cooling systems like the open loop cooling system mentioned on page 59, volume one of the PEIS. The cumulative impacts of these cooling systems are extremely concerning, especially if they're anything like those mentioned in sunrise wind documents which take in cool ocean water to dissipate heat produced through the A/C to D/C conversion of electricity. Each offshore cooling system will discharge up to 8,100,000 gallons of seawater daily with chlorine residuals and the temperature report per document is between 86 to 90°F per day. What happens to all the fish, larvae, phytoplankton, zoo plankton, and necessary microorganisms that end up in this wash cycle with bleaching chlorine?	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. A discussion of the potential impacts of cooling system discharge and intake on finfish, invertebrates, and EFH is provided in Section 3.5.5.3.3. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP level NEPA analysis will provide further details.
BOEM-2024-0001-0528z	Before proceeding with mass construction in Hudson Canyon, home of the unique marine environment with a cold pool, BOEM should	Thank you for your comment. Hudson Canyon is outside of the six NY Bight lease areas. However, as part of the subsequent COP

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	implement a pilot project, considering the studies on this cold pool were done in the North Sea, which is a different environment. Especially since the currents around the turbines are exactly what breaks down the cold pool.	NEPA analysis, BOEM plans to coordinate with the NOAA Office of National Marine Sanctuaries regarding the proposed designation of the Hudson Canyon National Marine Sanctuary. Please also see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Presence of Structures*, which discusses hydrodynamics, including the Mid-Atlantic Bight Cold Pool. Further, BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project specific COPs and EISs.
BOEM-2024-0001-0529k	At the same time there are, are at least 50 power transfer stations that will discharge billions of gallons of contaminated, superheated wastewater.	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0529n	It is unclear how many of these sites will use once through cooling stations like those mentioned in sunrise wind documents, these cooling stations, taking cool ocean water to dissipate heat produced through the AC to DC conversion of electricity. Each offshore cooling station will discharge up to 8,100,000 gallons of sea water with chlorine residuals and the temperature per BOEM's document is between 86 to 90°F. What happens to all the fish, larvae, phytoplankton, zoo plankton, necessary microorganisms that end up in this wash cycle?	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. A discussion of the potential impacts of cooling system discharge and intake on finfish, invertebrates, and EFH is provided in Section 3.5.5.3.3. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0310m	There's a handful of other things over the history here that I wanted to call out. BOEM, you're not that interested in the contents of what's in these turbines and what is in all of the substations. So for the 7500 megawatt plan, all of which you will be reviewing all the	Thank you for your comment. The NY Bight lessees will prepare project-specific Spill Prevention Control and Countermeasures and Oil Spill Response Plans prior to construction that are followed throughout the life of the project and monitor for and

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	individual plans for, there's 25 million gallons of industrial fluids in all of that construction that's sitting above the water just waiting for some destruction to dump it into the water. For the 1100 megawatt plan that goes up to 35 million gallons and this poster here shows what the U.S. plan for 86 gigawatts. Now, that would be BOEM managing all those all around the country. Right? And that's 117 million gallons of fluids, which if you total it up and compare it to things we're used to, that's 156 city water towers of fluids or 21 oil tankers worth of fluids sitting out there in the ocean waiting for some kind of pollution destruction. That's not too good for clean ocean. Right?	report any environmental releases or fish kills to the appropriate authorities or agencies. The Oil Spill Response Plans will need to meet USCG and BSEE requirements, which would provide for rapid spill response, cleanup, and other measures to minimize any potential impact on affected resources from spills and accidental releases, including spills resulting from catastrophic events. According to BOEM modeling (Bejarano et al. 2013), a release of 128,000 gallons (484,533 liters) is likely to occur no more often than once per 1,000 years, and a release of 2,000 gallons (7,571 liters) or less is likely to occur every 5 to 20 years. The probability of an accidental discharge or spill occurring simultaneously from multiple WTGs is extremely low.
BOEM-2024-0001-0310n	Factor this with an unknown number of substations and offshore cooling systems that will constantly be pumping chlorinated water at 90 degrees Farenheit, killing all phytoplankton and microorganisms that get sucked in.	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. A discussion of the potential impacts of cooling system discharge and intake on finfish, invertebrates, and EFH is provided in Section 3.5.5.3.3. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP-level NEPA analysis will provide further details.
BOEM-2024-0001-0310o	Sites that are more than 30 nautical miles offshore that are running HVDC will require offshore cooling systems, which are mentioned in the PEIS. And if they're like those described in Sunrise Wind's documents it's truly concerning. These cooling systems take in cool ocean water to dissipate heat produced through the AC to DC conversion of electricity. Each offshore cooling system will discharge up to 8,100,000 gallons of seawater with chlorine residuals per day and the temperature per documents is between 86 to 90 degrees Farenheit. What happens to all the fish larvae, phytoplankton, zooplankton and other necessary microorganisms that end up in this warm bleach wash cycle?	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. A discussion of the potential impacts of cooling system discharge and intake on finfish, invertebrates, and EFH is provided in Section 3.5.5.3.3. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP-level NEPA analysis will provide further details.

Comment No.	Comment	Response
BOEM-2024-0001-0529gg	One is in response to some of the folks who testified who are concerned about the open loop cooling systems. For instance, the one being utilized by Sunrise Wind. I think it would be important for the PEIS to juxtapose, the open loop cooling system from an offshore wind farm against power plants, fossil fuel-based power plants. So, for instance, in Northport on Long Island, where I live. They kill billions, with a "b", of finfish and fish larvae, juvenile fish, horseshoe crabs, crustaceans, and other marine species. So, all offshore, all energy infrastructure has an impact on our environment. We need to do a comparative analysis, so we choose the one with the least impact. And frankly, that's offshore wind.	Thank you for your comment. Since these projects are not related to the six NY Bight projects and site-specific details are not known at this time, we cannot make direct comparisons in this PEIS. However, we appreciate the commenter pointing this out in the public commenting process.
BOEM-2024-0001-0310t	What's been going on in the North Sea has been going on for quite some time now. So there are a lot of studies that are starting to come out on the effects of microclimate, on the effects of stratification, deoxygenation, sediment deposits. There's a lot of stuff coming out. Right? The research that we need, the data that we need to make more informed decisions with how we're going to approach renewable energy.	Thank you for your comment. Caution should be taken in extrapolating study outcomes from European wind farms to expected results in the NY Bight, as the environmental conditions are not equal. European wind farm facilities are in shallower waters with weak seasonal stratification, are in sheltered areas along the coasts, and are arranged with tight spacing of turbines (Lentz 2017; Hogan et al. 2023). Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Presence of Structures*, which describes potential hydrodynamic impacts.
BOEM-2024-0001-0310h	So might I ask what is the point? In fact, the proposed cooling stations will mimic climate change and kill off fish larvae, zooplankton, microorganisms, et cetera, by taking in cool, clean ocean water at up to 8.1 million gallons per day and mixing it with chemicals, such as bleach and discharging it back into the ocean at 86 to 90 degrees Fahrenheit.	Additional analysis has been added to Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/Intakes,* to further describe the warm water discharges. A discussion of the potential impacts of cooling system discharge and intake on finfish, invertebrates, and EFH is provided in Section 3.5.5.3.3. CWA Section 316(b) requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The project-specific COP-level NEPA analysis will provide further details.

P.5.5 Bats

Table P.5-5. Responses to Comments on Bats

Comment No.	Comment	Response
BOEM-2024-0001-0325-0001	Bat Conservation International (BCI) wishes to provide information in response to draft programmatic environmental impact statement (PEIS) to analyze the potential impacts of wind energy development in six lease areas of the New York (NY) Bight. BCI has actively worked with the Department of Energy and energy producers to find methods that minimize bat mortality at wind turbines. Bats experience high rates of mortality as a result of collisions with land-based wind turbines with hundreds of thousands of individuals killed a wind facilities across the United States and Canada (Hein and Schirmacher 2016). Bats have been consistently observed in offshore environments across the world (Solick and Newman 2021). The reasons for bats to be active offshore are poorly understood but it is likely that some species migrate over portions of the ocean between landmasses (Ahln et al. 2009 Brabant et al. 2020) and use coastlines as migratory corridors. Coastal islands with foraging and roosting habitat are used as stopover sites for some migratory species (Tenaza 1966 Cryan and Brown 2007 Peterson et al. 2014a). Considering the risk land-based wind energy poses to some bat populations and the documented activity of bats offshore it is reasonable to assume that offshore wind energy development can contribute to declines in bat populations. Additionally offshore wind energy development has been shown to provide foraging and roosting habitat (Willmott et al. 2023) for bats and consequently might attract bats increasing the risk of mortality from collision with offshore wind energy turbines.	BOEM acknowledges the presence of bats in the offshore environment, as documented in PEIS Section 3.5.1. BOEM used the best available information to describe bat presence in the offshore environment in the PEIS. Bat presence in the offshore environment is low and represents a very small percentage of total populations onshore. Therefore, BOEM does not anticipate population-level effects from offshore wind activities. Refer to responses to comments BOEM-2024-0001-0325-0002 and BOEM-2024-0001-0325-0003 for additional information on bat presence offshore versus onshore.
BOEM-2024-0001-0325-0002	Unfortunately we feel the draft PEIS misinterprets or overlooks important aspects of the available science and therefore minimizes the potential negative impact offshore wind energy in the NY Bight region may have on bat species. While the risk of offshore wind energy to bats is largely unknown the level of observed bat activity and impact of onshore wind turbines indicates that there should be greater concern about offshore wind turbine impacts to bat populations than is currently evaluated in the draft PEIS. The	BOEM acknowledges the temporal difference between the survey data presented in Johnson (2011) and the NJDEP Ecological Baseline Studies survey data collected in 2020 and 2021 in Lease Area OCS-A 0499, to which the Johnson (2011) data is compared. However, various sources clearly indicate that bat activity levels are generally lower in the offshore environment compared to onshore, as cited in PEIS Section 3.5.1.1 (see Hein et al. 2021, Brabant et al. 2021, Stantec 2020, Dominion Energy 2022, Atlantic

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	conclusion that risk to bats is low because offshore bat activity rates are less than Johnson 2011 is flawed. The sampling in Johnson 2011 occurred in 2007 and 2008 when the Appalachian range had a rich and abundant bat community not yet impacted by White-nose Syndrome. The high level of activity and migratory activity associated with the Appalachian range leads to some of the highest recorded levels of fatality in the United States sometimes greater than 100 bats per turbine (Kunz et al. 2007). The comparison of offshore bat activity to activity rates in the Appalachian mountains is flawed both spatially and temporally.	Shores 2022, and TetraTech 2022). In addition, the DOE funded an acoustic survey of bat activity offshore and at coastal sites (onshore mainland locations on and near the shoreline) in the New England Gulf of Maine, mid-Atlantic coast, and Great Lakes regions in 2012–2014. This was a very large survey effort across a wide area that detected a total of 565,158 bat passes during a total of 17,730 detector nights. The mean number of bat passes per night in offshore open water was 4.96, while the number of bat passes per night for coastal onshore was significantly higher at 112.6. This information has been added to PEIS Section 3.5.1 and is cited as Stantec 2016. BOEM used the best available information to describe bat presence in the offshore environment in PEIS Section 3.5.1. Bat presence in the offshore environment is low and represents a very small percentage of total populations onshore.
BOEM-2024-0001-0325-0003	Recent evidence shows activity levels are not drastically different onshore and offshore although offshore may be less distributed across time (i.e. more 'clumped'). Acoustic data from the Gulf of Maine and mid-Atlantic show levels of bat activity in the offshore environment are similar to those documented in open arid land in the United States with 2.57 passes/night at offshore locations in the Gulf of Maine and mid-Atlantic (Peterson et al. 2014b Peterson 2016) and average of 1.07 bat passes per detector night within the Coastal Virginia Offshore Wind Area (Tetra Tech Inc. 2022 Table O-2-2). For comparison activity rates in pre-construction onshore wind farm surveys averaged 1.89 bat passes per detector night with a range of 0.53 to 6.27 bat passes per detector night (Solick et al. 2020). Therefore the 6.2 bat passes per detector night in Lease Area OCS-A 0499 is on the high end of bat activity at wind energy facilities not low end of activity rates. Regional average bat fatalities range from 1.11-10.87 bats/MW capacity (AWWI 2020). Arid regions have an average of 1.99 (Pacific Southwest) and 6.01 (Southwest) bats/MW (AWWI 2020).	Open arid lands in the United States are outside of the bats' geographic analysis area defined in the PEIS and consist of an environment and habitats that are very different than the terrestrial area along the United States Atlantic coast. Refer to response to comment BOEM-2024-0001-0325-0002 regarding the comparison of bat presence in the offshore environment and onshore environment in the geographic analysis area. BOEM reviewed Appendix B in the AWWI (2020) study and acknowledges the low fatality numbers cited by the commenter for the arid regions of the United States. However, BOEM notes that the Northeast region shows 8.65 fatalities per MW onshore, which indicates a higher density of bats onshore in the Northeast.
BOEM-2024-0001-0325-0004	Eastern red bats are the most commonly detected and broadly distributed bat species off the coast of North America (Sjollema et al.	BOEM acknowledges the presence of eastern red bats in the offshore environment, as documented throughout PEIS Section

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	2014 Peterson 2016). Tracking data show they can travel vast distances over short periods of time with one individual documented flying 453 km in one night likely over the Atlantic Ocean between Long Island and New Jersey (Dowling et al. 2017). They were identified in 26 of 40 published visual records from the Atlantic and made up 89.8% of echolocation calls classified to species in acoustic surveys at structures off the Gulf of Maine and mid-Atlantic (Peterson 2016 Solick and Newman 2021). They are also broadly distributed occurring at 88% of offshore structures at 75% of which they were the primary species detected.(Solick and Newman 2021) This included a buoy located 18.8 km from shore where high levels of activity (8 passes/night) were recorded over a span of nine consecutive nights in August 2012 potentially illustrating a pulse of migratory activity or indicating that they used the buoy as a roost (Peterson 2016 Solick and Newman 2021). Aerial surveys conducted off the coasts of New Jersey Delaware and Virginia in September 2012 identified 11 easter red bats from 16.9 to 41.8 km from land and a vessel-based survey documented a sighting about 44 km off the coast of Delaware (Hatch et al. 2013). Studies at the Coastal Virginia Offshore Wind Pilot Project documented eastern red hoard and silver-haired bats in the project area about 44 km offshore including acoustic recordings and observations of bats roosting on vessels (Bureau of Ocean Energy Management 2022). Acoustic monitoring at the Atlantic Shores Offshore Wind area recorded five species or species groups (Myotis) with eastern red bats being the most frequently recorded (BOEM 2023). Given the broad distribution and relatively high levels of activity of eastern red bats in the offshore environment and the high rates of mortality experienced by the species at terrestrial wind farms it is likely that offshore wind energy infrastructure will pose a high level of risk level to the species.	3.5.1 using the same information and studies referenced in the comment. However, as described in Section 3.5.1, bat presence for all species in the offshore environment is low and represents a very small percentage of total populations onshore. Therefore, the risk level to the species is low for all IPFs addressed for the offshore environment.
BOEM-2024-0001-0325-0005	Hoary bats have been regularly observed on islands in the Atlantic including the Orkney Islands (Barrett-Hamilton 1910) Iceland (Hayman 1959) Southampton Island (Hitchcock 1943) Newfoundland (Maunder 1988) and Bermuda (Allen 1923 VanGelder and Wingate 1961) with most records occurring in the fall indicating that members of this species fly considerable distances across the ocean seasonally.	BOEM acknowledges the presence of hoary bats in the offshore environment, as documented in PEIS Section 3.5.1. Offshore surveys at the Block Island Wind Farm, Coastal Virginia Offshore Wind Pilot, and Lease Area OCS-A 0499 identified hoary bat presence. However, as described in PEIS Section 3.5.1, bat presence for all species in the offshore environment is low and

Comment No.	Comment	Response
	Acoustic surveys off the northeastern coast of the continent reveal low levels of activity (4% of recordings) but broad distributions with occurrences at 88% of offshore survey locations (Solick and Newman 2021). Studies at two project areas off the coast of the US documented hoary bat activity in offshore wind call areas (BOEM 2022 BOEM 2023). Hoary bats can fly at high elevations (Peurach 2003) and at times without echolocating (Corcoran and Weller 2018 Corcoran et al. 2021) potentially causing them to be under sampled by acoustic surveys (Solick and Newman 2021). Despite apparently low levels of activity in the offshore environment given their broad distribution and high rates of fatality at terrestrial wind turbines we determined that the threat of offshore wind energy infrastructure is high for this species. With current predictions of a potential 90% reduction of the species' population by 2061 (Frick et al. 2017a) any additional threats (such as offshore wind energy) could reduce hoary bats chances at survival. The hoary bat was added to the USFWS workplan for a species status assessment in 2027.	represents a very small percentage of total populations onshore. Therefore, the risk level to the species is low for all IPFs assessed for the offshore environment.
BOEM-2024-0001-0325-0007	Collisions with wind turbines are the leading cause of mortality for several bat species and are a primary contributor to the dramatic decline of at least one species of bat in North America (Frick et al. 2017b Friedenberg and Frick 2021). While the magnitude of effect that offshore wind infrastructure will have on bats is currently unclear precautionary measures should be put in place to minimize additional take of vulnerable bat species. While additional study is needed there are clear actions that can be taken as part of the PEIS.	BOEM acknowledges the presence of several bat species in the offshore environment in the geographic analysis area. Based on best available information— including literature, studies, and offshore bat surveys documented and described in PEIS Section 3.5.1—bat presence in the offshore environment is low and represents a very small percentage of total populations onshore. As such, BOEM anticipates the risk to bat species from offshore IPFs is low. However, though there is still some level of uncertainty regarding risk to bats offshore, the analysis in the PEIS is sufficient to support sound scientific judgments and informed decision-making related to bat distribution and use of the offshore environment as well as the potential for collision risk of bats (see PEIS Appendix E). Alternative C includes several bat AMMM measures that would result in learning more about bat presence in the offshore environment and bat interactions with offshore wind infrastructure. In addition, BOEM would consider additional or different AMMM measures for project-specific environmental analyses for a given NY Bight lease area for which a COP is submitted.

P.5.6 Benthic Resources

Table P.5-6. Responses to Comments on Benthic Resources

Comment No.	Comment	Response
BOEM-2024-0001-0089-0001	The NY EIS should be discarded as submitted. There are numerous instances where knowledge gaps exist that are dismissed as inconsequential to the project. Examples include gaps in knowledge of EMF emissions impacting benthic layers and the authors suggest that ongoing studies taking place at Block Island Wind Farm which has consistently operated at a fraction of its stated capacity or not at all should suffice as evidence that the project should forge ahead. This is IRRESPONSIBLE!	The PEIS uses the best available information and, therefore, complies with the procedural requirements of NEPA to predict potential impacts on benthic resources from expected development in the NY Bight lease areas. Although knowledge gaps exist, the available information is sufficient to support sound scientific judgments to inform decision-making for the projects, as discussed in the PEIS. Text regarding EMF emissions and potential impacts has been updated with the latest science. Models are most common in understanding EMF, and published studies rarely rely on measured EMFs. Measured cable EMFs are rare, especially for offshore wind projects. Block Island Wind Farm is used because there were actual measurements from those cables and the post-construction surveys show a thriving benthic ecosystem.
BOEM-2024-0001-0217-0004	Benthic environment destruction: concern that the construction of offshore energy infrastructure could damage the seafloor habitats that support Sand Lance populations a key food source for humpback whales. Positive impact of whales on the ecosystem	Thank you for your comment. Brief text about the sand lance and associated references have been added to the PEIS. Impacts on seafloor habitats will also depend on the ambient conditions. For example, when ambient levels of suspended sediment and the degree of variation throughout the year are high, then the degree of impact from suspended sediment is likely to be less during that same year.
BOEM-2024-0001-0262-0003	The destructive impact to marine ecosystems already being caused by the preliminary surveying is being blatantly ignored by organizations such as NOAA who are supposed to be acting in the best interest of marine wildlife. I can only imagine the destruction that will ensue once actual cable installation and construction begin.	Thank you for your comment. The PEIS is based on the best available science to date. Research on marine impacts of offshore wind development will continue to grow and future contributions to the knowledge base are expected.
BOEM-2024-0001-0313-0020	Page 2-8 goes on to state "Monopile and piled jacket are anticipated to be the most likely foundation types to be used for the NY Bight projects. Monopile foundations typically consist of a single steel cylindrical pile that is embedded into the seabed and is made up of sections of rolled steel plate welded together. A transition piece is fitted over the monopile and secured via bolts or grout from where the tower is attached. Piled jacket foundations are large lattice	Thank you for your comment. Sediment dispersion modeling from other OSW projects within the NJ and NY WEAs estimated that the maximum turbidity of all sediment disturbance due to various cable installation scenarios (>100 mg/L) would not last longer than 9.1 hours and that turbidity would be below 10 mg/L within 17.7 hours. Project-specific COPs and COP NEPA analyses will address particular mitigation measures, including but not

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	structures fabricated of steel tubes welded together and typically consist of three- or four-legged structures to support WTGs and OSSs. For monopile and piled-jacket substructures the foundations would be driven to the target seabed penetration depths by hydraulic impact hammering vibratory hammering water jetting drilling or a combination of methods." Comment There are a number of concerns regarding the above statement that should be addressed during the environmental review process. There do not appear to be any indications that a turbidity curtain or other similar mitigation measures to reduce impacts from the sedimentation and impacts of increased turbidity will have on the surrounding benthic habitat - including water quality impacts.	limited to RP MUL-27, which aims to minimize sediment disturbance.
BOEM-2024-0001-0313-0042	3.5.2.1.1 Offshore Benthic Resources The PEIS states "Benthic invertebrates in the NY Bight area also include commercially viable species such as the Atlantic surfclam (Spisula solidissima) and ocean quahog (Arctica islandica) which have experienced mortality of large adults and declining recruitment (NEFSC 2017). Guida et al. (2017) found ocean quahogs and Atlantic surfclams were sparsely distributed within water depths of 98.4 feet (30 meters) with increased abundance in deeper waters reaching a maximum of 4025 quahogs per sample twice the amount of surfclam present per sample (Grothues et al. 2021; Guida et al. 2017). The shifting of increased abundance in deeper water supports the theory that warming waters in shallow offshore waters are driving these bivalves into deeper cooler waters (Grothues et al. 2021). As ocean temperatures increase the distribution and biology of Atlantic surfclam are also changing with likely effects on fishery productivity (Munroe et al. 2016). Atlantic sea scallops were absent within 98.4 feet (30 meters) water depth and sparse from 98.4 to 164 feet (30 to 50 meters) reaching the maximum near the edge of the Hudson Shelf Valley. See Section 3.6.1 Commercial Fisheries and For-Hire Recreational Fishing and Section 3.5.5 for additional information. Studies of the U.S. Atlantic coast have shown spatial shifts of benthic species in response to the warming ocean temperatures from 1990 to 2010 (Hale et al. 2017). With predicted continual temperature increases in the waters of the NY Bight area it is expected that the	BOEM agrees that filter feeders can improve water quality through filtration. Although some habitat will be lost due to the offshore infrastructure footprint, the additional hard structure can foster habitat for filter feeders as well, especially on the vertical structures.

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	shift of marine species distribution northward and to deeper waters would continue (BOEM 2021)." Comment Shellfish have been found to filter up 50 galls of water per day and are an integral biological component to improved water quality through their filtration processes. The PEIS should include an analysis of the amount of water quality benefits lost due to the extensive benthic area lost due to trench laying and the footprint of all structures.	
BOEM-2024-0001-0313-0045	Affected Environment and Environmental Consequences 3.5.2-14 "Due to the life cycles of demersal finfish and invertebrate species adverse impacts may be far-reaching (see Section 3.5.5). Elevated turbidity and sediment deposition would also impact seagrasses in inshore waters. Increased turbidity decreases the amount of light availability and may inhibit growth or recovery from disturbance (de Boer 2007; LaFrance Bartley et al. 2022)." "Cable emplacement activities in sensitive habitats such as SAV or mollusk reefs would have a greater impact and require longer periods for recovery. In areas where cable protection is added the benthic community would be permanently impacted." "Kraus and Carter (2018) studied seabed recovery following the burial of subsea cables on the continental shelf. Their results showed that water-jetted trenching methods take roughly 815 years to infill trenches depending on sediment availability mobility and water depth. They concluded that along the mid-shelf where water depths range from 98263 feet (3080 meters) recovery usually takes 2 years though it may exceed 5 years if the adjacent sediment supply is low (Kraus and Carter 2018)." Comment - Similar to the above comment the water quality impact of loss of SAV should also be reviewed in the PEIS. It is extremely concerning that permanent impacts are not comprehensively evaluated in the PEIS. The statement above regarding sediment redistribution is also concerning in that the composition of the sediment and the stratification will be different as compared to its natural state. Again the impacts to the benthic community do not appear to include the potential adverse impacts of suffocation of sensitive species the impacts from turbidity and the direct and indirect impacts to water quality.	The PEIS uses the best available information and complies with the procedural requirements of NEPA to predict potential impacts on benthic resources. The proposed cable routes and potential landing sites will be surveyed, and details will be provided in the project-specific COP. Substrates and habitats will be described in more detail at that time.

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BOEM-2024-0001-0331-0037	Theoretical scenario simulations provide evidence that the increasing amount of future OWF installations will substantially impact and restructure the marine ecosystem. Changes in mixed layer depth have been reported earlier in North Sea wind area as a consequence of offshore wind farm wakes due to the reduced wind induced mixing but also due to the upwelling and downwelling dipoles Since the dipole structure is associated with both an uplift and a depression in mixed layer depth and is variable in dependence of the wind direction. The marine ecosystem responds very clearly to the changes in the atmosphere leading to changes in ocean stratification advective processes and a systematic decrease in bottom shear stress. These changes can be expected to progress into higher trophic levels of the marine ecosystem. Additionally the estimated changes in organic sediment distribution and quantity could have an effect on the habitat quality for benthic species. Spatial distributions might change as it has been shown to depend on the available food quantity and quality as well as the prevailing bottom shear stress.	As stated in the most recent inclusive study for United States waters (National Academies of Sciences, Engineering, and Medicine 2023), "to date, few studies exist to assess the potential hydrodynamic and ecological impacts of offshore wind development, and those that do exist consist of modeling studies with limited observational data developed for wind farms in the North Sea, which have different hydrodynamic and ecosystem characteristics." This study concluded that the hydrodynamic impacts would be difficult to distinguish from natural variability and other outside forces, such as climate change.
BOEM-2024-0001-0331-0039	The PEIS should have presented the level of impacts on re-structuring of marine ecosystems on energy extraction both above and below sea level. Impacts on the regional atmosphere multiple physical biological and chemical impacts on the marine system must be identified in the project PEIS. Complicating these effects underwater structures such as foundations and piles may cause turbulent current wakes which impact circulation stratification mixing and sediment resuspension.	Refer to the response to comment BOEM-2024-0001-0331-0037.
BOEM-2024-0001-0332-0011	EMF Electro-Magnetic Field Cable Emissions With regards to EMF there MUST be a threshold level of EMF emissions that are identified as acceptable or unacceptable for the marine environment and this should change in consideration to the water depth. The same emf emissions in deep open water that fish may feel react and get up over very well may have a much more powerful effect in shallow estuaries and bays.	As stated by Hogan et al. 2023 at this time, no thresholds of the acceptable or unacceptable levels of EMF emissions have been determined for the marine environment.
BOEM-2024-0001-0346-0013	The Draft PEIS Identifies A Wide Range of Impacts from Offshore Wind Development Against Which Site-Specific Analyses Will Need to Protect Fisheries and Fishing Grounds Scallops are particularly susceptible to offshore wind development. They are sessile and exist	Thank you for your comment. Chen (2021) looked at the potential impacts of offshore wind on regional scallop settlement and stated, "The results indicate that the scallop larval settlement exhibited a significant interannual variability...The larval transport

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	at the mercy of pelagic and benthic conditions that allow for their settlement survival and growth. Among other things these conditions include bottom composition currents that bring nutrients to scallops and that cause larvae to settle and turbidity. As the PEIS explains wind farm development will change all these environmental attributes in a manner that is negative for the scallop resource. BOEM itself explained in the Draft PEIS: A synthesis of European studies by van Berkel et al. (2020) [Footnote 4:: Van Berkel et al. The Effects of Offshore Wind Farms on Hydrodynamics and Implications for Fishes Oceanography Vol. 33 Issue 4 p. 108-117 (2020). Available at https://tos.org/oceanography/assets/docs/33-4_van-berkel.pdf (last accessed on June 24 2022).] summarized the potential effects of wind turbines on hydrodynamics the wind field and fisheries. Local to a wind facility the range of potential impacts include increased turbulence downstream remobilization of sediments reduced flow inside wind farms downstream changes in stratification redistribution of water temperature and changes in nutrient upwelling and primary productivity. (3.5.6-48) . . . . In terms of the changes to currents the Draft PEIS identified at least two negative attributes of note for scallops: upwelling brings the phytoplankton that scallops eat to the surface (and away from the scallops) and forces warm surface waters detrimental to scallops' survival to the bottom. As the Draft PEIS further explains: Structures may reduce wind-forced mixing of surface waters whereas water flowing around the foundations may increase vertical mixing (Carpenter et al. 2016). During summer when water is more stratified increased mixing could increase pelagic primary productivity near the structure increasing the algal food source for zooplankton and filter feeders. Increased mixing may also result in warmer bottom temperatures increasing stress on some shellfish and fish at the southern or inshore extent of the range of suitable temperatures. (3.6.1-49) Localized turbulence and upwelling effects around the monopiles are likely to transport nutrients into the surface layer potentially increasing primary and secondary productivity. That increased productivity could be partially offset by the formation of abundant colonies of filter feeders on the monopole foundations. (3.6.1-49) While the PEIS tries to minimize	to the MAB is closely related to the intensity of the cold pool and temperature front." Miles et al. (2021) studied the potential effects of offshore wind farms on the Mid-Atlantic Bight Cold Pool. See Section 3.5.6.3.3 for further discussion. Refer to the response to comment BOEM-2024-0001-0331-0037 for a response to the general hydrodynamic changes.

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	these impacts as "localized" what BOEM really means is "local[ized] to a wind facility." (3.6.1-48) This clarification makes sense as wind turbines will only be 0.6 nautical miles apart from each other (3.6.1-49). Furthermore it is reasonable to consider the New York Bight wind lease areas as one giant facility. Four of these six areas are packed together in one unit with no particular provision made for their separation. "The overall impact on stratification is directly related to the scale of development." (3.5.2-29) Packing these six areas tightly together and developing them during the same time period can also yield "regional" changes in benthic stability and species composition. (3.5.2- 31-32) Indeed these six lease areas' concentration is a principal reason BOEM developed this Draft PEIS. None of this bodes well for the scallop settlement survival and growth especially with these lease areas being concentrated in the center of the Mid-Atlantic scallop resource.	
BOEM-2024-0001-0346-0014	The Van Berkel paper on which BOEM relies explains how broadly these hydrodynamic impacts have been observed: "Hydrodynamics play a pivotal role in controlling turbidity sedimentation salinity temperature and nutrient uptake in coastal systems." And these "hydrodynamic impacts are transferred to the ocean via two routes: (1) modification of the wind field and consequently the wave and current fields due to the direct effect of power extraction from the wind and (2) wind turbine foundations' effects on ocean currents and consequently on turbulence mixing and vertical stratification." These hydrodynamic effects were recorded to "extend 5-20 km in the downwind direction depending on weather conditions." For its part BOEM confirmed that: [B]roadscale hydrodynamic impacts could alter zooplankton distribution and abundance with impacts that may extend to tens of kilometers from structure foundations (Christiansen et al. 2022; van Berkel et al. 2020). (3.5.6-50) Further a second even more recent paper cited by BOEM also explained the impacts that offshore wind farms have on ocean hydrodynamics. The Draft PEIS reports that: Daewel et al. (2022) modeled the effects of offshore wind farm projects in the North Sea on primary productivity and found that there were areas with both increased and decreased productivity within and around the wind farms. There was a	Refer to the response to comment BOEM-2024-0001-0346-0013.

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	decrease in productivity in the center of large wind farm clusters but an increase around these clusters in the shallow near-coastal areas of the inner German Bight and Dogger Bank (Daewel et al. 2022). (3.5.6-49) Scallops generally are not found in the shallower waters of the New York Bight as can be seen from relatively lower landings in Lease Areas OCS-A 544 and OCS-A 541. (3.6.1-12) Scallops generally begin to be found at depths of 20-25 fathoms.	
BOEM-2024-0001-0346-0015	The Draft PEIS likewise soft-pedals the potential impacts from offshore wind farms to scallop larval distribution. As FSF explained in its scoping comments BOEM commissioned an exercise to model the potential wind farms' impacts on larval distribution. The modeling predicts significant impacts on scallop larval distribution but the paper then rationalized that "The results of this modeling effort indicate that at a regional fisheries management level these shifts are not considered overly relevant with regards to larval settlement." (3.5.5-34) [Footnote 5: The BOEM-funded study in question is T. Johnson et al. Hydrodynamic Modeling Particle Tracking and Agent-Based Modeling of Larvae in the U.S. Mid-Atlantic Bight OCS Study BOEM 2021-049 (June 2021). Available at https://espis.boem.gov/final reports/BOEM_2021-049.pdf (last accessed on June 24 2022).] The actual Johnson et al. modeling tells a different story. Any reasonable review of Figures 1 and 2 (below) reveals a redistribution of scallop larvae over dozens of miles. Indeed due to the projected effects of wind farms south of Martha's Vineyard scallop larvae were redistributed along an area from well east of Nantucket to well west of Montauk. SEE ORIGINAL COMMENT FOR Figure 1: Predicted differences in settled larval sea scallop density (larvae/m2) from full build-out OSW lease offshore MA- RI area 12 MW turbines (1063 towers).Source: T. Johnson et al. SEE ORIGINAL COMMENT FOR Figure 2: Predicted differences in settled larval sea scallop density (larvae/m2) from full build-out OSW lease offshore MA- RI area 15 MW turbines (1063 towers).Source: T. Johnson et al.	Refer to the response to comment BOEM-2024-0001-0346-0013.
BOEM-2024-0001-0362-0023	BOEM should analyze the benefits derived from offshore wind developers conducting appropriate benthic surveys for cable routes	Based on BOEM’s understanding of the comment, it is possible that surveys within the Lease Area could identify areas of contamination from previous sources. This information may be

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	and other activities that may exacerbate existing contamination from urban and storm runoff industry or historic use of the site.	useful for analyzing cable corridors or other infrastructure of specific wind projects during project-specific COP NEPA analyses.
BOEM-2024-0001-0447-0002	Benthic Analysis This PEIS identifies total mortality of the benthic environment from scour protection. We agree the dropping of 1000 on tons of rock will completely change the environment on the sea floor. However it's even greater at 8 acres per windmill than .51 acres per windmill. We have no understanding how the science of this document can reach the conclusion that the result in benthic impact of a windfarm is negligible to minor of this sample project!	Thank you for your comment. The impact determinations are based on the best available science. Although some habitat conversion is expected due to cable and scour protections, the additional surfaces offer opportunities for the settlement of invertebrates, some of which are commercially important species such as mussels and oysters. A newly published study on the settlement success of the European flat oyster showed that granite had the highest settlement success. Granite is often used in scour protection for offshore wind projects (ter Hofstede et al. 2024). The majority of the substrate within the NY Bight is soft sediment. The amount of soft-bottom habitat that will be affected is relatively small compared to the available habitat in the surrounding area.
BOEM-2024-0001-0469-0013	Benthic communities are the foundation of the marine ecosystem. [Footnote 35: See Jacob P. Kritzer et al The Importance of Benthic Habitats for Coastal Fisheries 66 BIOSCIENCE 274 (Mar. 29 2016) https://doi.org/10.1093/biosci/biw014] Marine mammals are certainly charismatic and generate high levels of media reporting and public concern but it is important to focus efforts on the species on which the charismatic species rely. The Draft PEIS proposes only two (2) mitigation measures designed specifically to avoid minimize mitigate and monitor impacts on benthic communities. Twenty (20) of the AMMM measures address benthic communities in addition to other resources. There has been little dedicated research on impacts to benthic communities particularly regarding how electromagnetic fields ("EMF") will affect them and the potential secondary impacts of those changes. [Footnote 36: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT appx. E at E-3.] In fact research on the ecological impact of EMF is lacking for most species and "Mid-Atlantic OSW development will expose important seasonally migrating (north south inshore offshore) finfish and elasmobranchs to EMFs as their movements will periodically cross cables". [Footnote 37: BUREAU OF OCEAN ENERGY MGMT. EFFECTS OF EMFS FROM UNDERSEA POWER CABLES ON	EMFs are discussed in Section 3.5.2.3 under cumulative impacts, as other offshore wind farms are planned within the NY Bight area. CSA and Exponent (2019) studied potential EMF effects on fish species of commercial or recreational fishing importance in southern New England and concluded, “The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes within the southern New England area. Negligible effects, if any, on bottom-dwelling species are anticipated. No negative effects on pelagic species are expected due to their distance from the power cables buried in the seafloor.” Newer references of studies on DC cables emitting EMF have been added, and these align with CSA and Exponent 2019. It is important to note that cable configuration and spacing could lead to differences in the risk to benthic species. Details, including cable configurations, will be provided in project-specific COPs.

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	ELASMOBRANCHS AND OTHER MARINE SPECIES 1 https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Pacific-Region/Studies/2011-09-EMF-Effects.pdf; Zo L. Hutchison et al The Interaction Between Resource Species and Electromagnetic Fields Associated with Electricity Production by Offshore Wind Farms 33 OCEANOGRAPHY (2020) https://doi.org/10.5670/oceanog.2020.409] Quantitative risk assessments would help determine what mitigation efforts are needed to reduce EMF impacts. [Footnote 38: Annemiek Hermans et al Do electromagnetic fields from subsea power cables effect benthic elasmobranch behaviour? A risk-based approach for the Dutch Continental Shelf 346 ENV'T POLLUTION (Apr. 2024) https://doi.org/10.1016/j.envpol.2024.123570.] Though risks during embryogenic development and migration could be consequential is unclear whether or to what extent electrosensitivity will translate to behavioral or ecological change. [Footnote 39: Id.] Baseline studies are crucial as "distinguishing cable EMF effects from structure attraction or nearby fishing activity will be impossible without additional controls on the experimental setting". [Footnote 40: EFFECTS OF EMFS FROM UNDERSEA POWER CABLES ON ELASMOBRANCHS AND OTHER MARINE SPECIES supra note 38; Hutchison et al supra note 38.] BOEM must commission more study of EMF that determines the secondary effects of any behavioral responses to EMF before approving projects in the six New York Bight lease areas. Any assessment of EMF in the individual project review must include an estimate of the total area wherein EMF would be emitted accounting for all nearby OSW projects.	
BOEM-2024-0001-0469-0014	Another potential risk to benthic communities comes from an impact that is often presented as a benefit: [Footnote 41: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 3.5.5-44.] turbine foundations acting as artificial reefs. While artificial reef habitats may be beneficial for organisms that prefer those environments it is not necessarily a benefit for the naturally occurring marine wildlife and can alter the composition of the marine community and predator-prey dynamics near wind turbine installations. [Footnote 42: L. Bennun et al Biodiversity	The "reef effect" and adverse effects of habitat conversion on softbottom species and communities are addressed in Section 3.5.2.3.2., and 3.5.2.4.4. The Bennun et al. 2021 citation was added. Beneficial aspects of the reef effect have also been called out in nearby offshore wind projects, such as Empire Wind 1 and Atlantic Shores South. AMMM measure MUL-4 and RP MUL-12 incorporate ecological design elements in scour protection (e.g., using nature-based scour protection such as oyster beds or other artificial reefs) to

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	Impacts Associated to Offshore Wind Power Projects INT'L UNION FOR CONSERVATION OF NATURE (2021) https://www.iucn.org/sites/default/files/2022-06/01_biodiversity_impacts_associated_to_off-shore_wind_power_projects.pdf.] New habitats could even attract and facilitate the growth of invasive species especially if they are already present in the area but no AMMM measures address invasive species. [Footnote 43: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 3.5.2-14 Appx. G.]Similar to the analysis of marine mammals BOEM concludes that these unknowns do not prevent it from choosing among the Draft PEIS alternatives. Again this is unreasonable as benthic communities and sediment carbon storage are rarely analyzed in studies and serve a vital role in the marine ecosystem.	provide suitable substrate for increasing the probability of recolonization. While these do not directly address invasive species, colonization does inhibit the growth of many sessile invasives.
BOEM-2024-0001-0529k	And of course there's the thousands, tens of thousands of miles of cables emitting electromagnetic fields, including high voltage cables known to affect marine life.	An EMF analysis is provided in Sections 3.5.5.3.3 and 3.5.5.4.1. EMF exposure levels in the built environment are not expected to reach high enough energy levels to have an impact on populations, and there is no evidence to indicate that EMFs from undersea alternating current (AC) or DC power cables negatively affect commercially and recreationally important fish species (CSA Ocean Sciences Inc. and Exponent 2019; Gill and Desender 2020; NYSERDA 2017; SEER 2022; Taormina et al. 2018). Additionally, RP MUL-39 proposes using electric shielding on underwater cables to control the intensity of EMFs.
BOEM-2024-0001-0529cc	However, the reef effect is not what you've been told. The reef effect is actually called biofouling. You've got essential environment in the mid-Atlantic Bight, and by literally putting turbines, you are creating an environment that is ripe for invasives, such as sea-squirts as the muscles which are going to…Actually, there's a study, and let me see if I can find it, and if I can't, I can't in time. The Tethys has a fouling community on turbine foundations and scour protections. They basically become magnets for anything that happens to float by, and they completely change an essential environment into a hard substrate, and the ecosystems within it.	Thank you for your comment. The "reef effect" and adverse effects of habitat conversion on softbottom species and communities are addressed in Sections 3.5.2.3.2 and 3.5.2.4.4. The Bennun et al. 2021 citation was added. Additionally, as discussed in Section 3.5.2.4.2, *Benthic Resources*, a recent study published by Li et al. (2023) found that the artificial reef effect from wind farms in the North Sea could lead to a doubling of species richness and an increase of species abundance by up to two orders of magnitude. AMMM measure MUL-4 and RP MUL-12 incorporate ecological design elements in scour protection (e.g., using nature-based

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		scour protection such as oyster beds or other artificial reefs) to provide suitable substrate for increasing the probability of recolonization. While these do not directly address invasive species, colonization does inhibit the growth of many sessile invasives. The introduction of invasive species is discussed in Section 3.5.2, *Benthic Resources*, under the accidental releases, cable emplacement and maintenance, and presence of structures IPFs.
BOEM-2024-0001-0310o	Many believe on a cumulative level we're going to warm the ocean significantly. Thousands of miles of EMF laden cables, and these aren't telecom cables that people like to mention. These are high voltage electrical cables jet trenched through our ocean floor, plowing through all these ridges and ledges that provide habitat. It's sickening to think of.	Cables associated with offshore wind projects will be buried in the ocean floor. Heat from the cables will be highly localized to the sediments within the immediate vicinity of the cables. Based on controlled experiments, Emeana and others (2016) measured > 10°C increases in sediment temperature at distances ranging from 40 centimeters to over a meter from a cable source; these temperatures varied, depending on sediment substrate type and source temperature of the cable. An EMF analysis is provided in Sections 3.5.5.3.3 and 3.5.5.4.1 of the PEIS. Additionally, RP MUL-39 proposes the electric shielding on underwater cables to control the intensity of EMF. At this time, BOEM is not aware of any studies demonstrating increases in water column temperatures and decreases in CO_2 absorption as a result of the thousands of miles of existing operational submarine electric transmission cables.
BOEM-2024-0001-0529v	The PEIS states that artificial reefs provide valuable habitats to foster the biodiversity of marine invertebrates and finfish. So, their value is acknowledged in the document, but I am concerned that the PEIS seems to present full decommissioning as the default end of life plan for the wind farms, which would require any developer that wishes to retire any portion of the project in place to jump over additional hurdles. So given that the artificial reef benefits have already been well documented on other wind farms, we want BOEM to make partial decommissioning the default. This can be done by following the renewables to reef concepts that is presented in a 2015 paper by Smith and colleagues. This leaving the scour protection in place can ensure that the artificial reef communities that become established there over	Thank you for your comment. As discussed in Section 3.5.2.4.2, *Benthic Resources*, a recent study published by Li et al. (2023) found that the artificial reef effect from wind farms in the North Sea could lead to a doubling of species richness and an increase of species abundance by up to two orders of magnitude. Lessees are required to remove all human-made structures from the seafloor unless direct approval from BSEE is determined during the lessee's decommission application review. Decommissioning is covered by BSEE under 285.902, which details the decommissioning application review and approval process, while 285.910 details removal of facilities. Additionally, 285.909 details the authorization to have facilities remain in place; specifically, 285.909.909(c) speaks to facilities that will be

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	decades of operation, can remain there in perpetuity. A 2017 paper on Sustainable Decommissioning of Wind Farms by Topham and McMillan acknowledges that there's no one size fits all solution. So the specific decommissioning plan for each project will be site specific. But as a general rule, scour should be left in situ, because marine life will have flourished around scour, protecting any element of the wind farm. So preserving these reefs could be especially consequential for recreational and subsistence fishermen, as we anticipate that these reefs will become a destination for fishing activity akin to oil rig fishing in the Gulf of Mexico. It would be nonsensical to facilitate the growth of this ecological and economic activity only to remove it later. So, we are asking BOEM to take steps as early as possible to ensure the preservation of these reefs.	toppled in place or converted to artificial reef purposes (https://www.ecfr.gov/current/title-30/chapter-II/subchapter-B/part-285/subpart-I/subject-group-ECFR73f535d05e8b5d9/section-285.909). BOEM will conduct project-specific NEPA analysis of the COP for each lease area, focusing on site- and project-specific analyses that were not already addressed by the PEIS.

P.5.7 Birds

Table P.5-7. Responses to Comments on Birds

Comment No.	Comment	Response
BOEM-2024-0001-0357-0007	Neither this draft program EIS or any project specific EIS presents a cumulative assessment of the deaths to the endangered /threatened piping plover and red knot bird as it attempts to migrate through the NJ/NY Bight area on its traditional routes. No substantive AMMM measures are presented to mitigate this risk (See Enclosure IV) .	Cumulative impact analyses for all birds collectively are addressed in PEIS Sections 3.5.3.3.3, 3.5.3.3.4, 3.5.3.4.4, 3.5.3.4.5, 3.5.3.5.4, and 3.5.3.5.5. Cumulative impacts on federally listed threatened and endangered species (including piping plover and red knot) are addressed in more detail as part of BOEM's consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, which was initiated on June 20, 2024.
BOEM-2024-0001-0357-0020	The closer in turbines will likely kill the piping plovers as they attempt to cross the wind complex to get to their nesting grounds on the island. Farther out we also have risk to the birds from the turbines in the other areas while they migrate but perhaps with more room for the bird to circumvent those complexes.	Impacts on federally listed threatened and endangered species (including piping plover) are addressed in more detail as part of BOEM's consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, which was initiated on June 20, 2024.

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BOEM-2024-0001-0357-0050	Enclosure IV Piping Plover Migration Routes Cumulative Impact The program EIS presents no meaningful AMMM measures to prevent the deaths of the piping plover and other migratory birds as they attempt to traverse the wind turbine complexes. The prior paths of the piping plover on its coastal migration are shown below. The operation of the turbines would impact the birds migrating offshore as well as those seeking to nest onshore for example at the Holgate and Barnegat Light locations on Long Beach Island NJ. SEE ORIGINAL COMMENT FOR MAP: Migratory routes of Piping Plovers Tracking stations Offshore Wind Energy Areas	Impacts on piping plover are addressed in more detail as part of BOEM's consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, which was initiated on June 20, 2024. The framework consultation includes the consideration of potential collisions with offshore wind turbines as well as impacts on nesting and AMMM measures to avoid and minimize impacts. In addition, a COP-specific BA for NY Bight lease areas that might be developed in the future would include project-specific analysis based on the most current and relevant piping plover information available at that time.
BOEM-2024-0001-0357-0051	The U.S. Fish and Wildlife Service provides monitoring and management of beach nesting birds at the Edwin B. Forsythe National Wildlife Refuge. The Refuge nesting sites both the Holgate and Little Beach Island Units provide some of the only habitat in the State closed to the public and free of human disturbance and detrimental beach management practices. The habitat at the sites is especially suitable for the State endangered piping plover as a result of optimal nesting conditions created by Superstorm Sandy and largely sustained since then through winter storms. As of the 2021 season the Refuge sites had the highest concentration of piping plovers in the state with Holgate having by far the most pairs (46). Furthermore on average in recent years Holgate has produced a higher fledgling rate than many sites in the state. The piping plover's existence is "threatened" under the Endangered Species Act (ESA) and should receive a review under that statute. About 86 plovers' nest in Holgate and Barnegat Light where they are protected others in the North Brigantine State Natural Area. It migrates offshore north-south PP1 and must cross the project area in and out from their nests. If heading toward turbines it would quite difficult for a 7-inch bird to first perceive and then avoid rotating blades with a 774-foot diameter and blade tip speeds approaching 200 miles per hour creating highly turbulent conditions. Assuming little avoidance of the entire wind complex to get to its historical nesting location as discussed below there is the potential for a high number of fatalities (PP2) estimated here at up to 31 percent per year. That is based on reference PP2 Figure 2.25 the average of the Chapin Dead Neck Avalon Stone Harbor results. It is also consistent with the percent of	Impacts on piping plover are addressed in more detail as part of BOEM's consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, which was initiated on June 20, 2024. Consultation with the USFWS occur concurrently with the NEPA process, and there is no ESA regulatory requirement to have consultation completed when the Draft PEIS is issued (although BOEM strives to complete consultation as soon as possible). On June 20, 2024, BOEM initiated consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation. In addition, a COP-specific BA for NY Bight lease areas that might be developed in the future would include project-specific analysis based on the most current and relevant piping plover information available at that time. BOEM notes that many of this commenter's comments (commenter ID BOEM-2024-0001-0357) are the same comments provided on BOEM's Atlantic Shores South Draft EIS and BA. (Atlantic Shores South is stated in several of these comments.) However, BOEM understands the general concerns and has responded in the context of the NY Bight lease areas.

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	transit area blocked by rotating blades and 2 flights per bird in and out. The Atlantic Shores South draft EIS presents no assessment of the turbine collision risk to the local endangered piping plover population that nests on the Island and must now cross the wind complexes to get there and back to its offshore migration routes. It discusses the existence of a preliminary biological assessment (BA) prepared for consultation under the Endangered Species Act but presents no results of that analysis in the draft EIS. It says that the final biological assessment will be available in the final EIS but that prevents the public from reviewing and commenting on this important impact. This is another example of lack of full disclosure and lack of coordination with other environmental reviews to the fullest extent practicable. This is another impact that must be presented in a supplemental draft EIS for public review.	
BOEM-2024-0001-0357-0052	Regarding turbine collision on page 3.5.3-18 the Atlantic Shores draft EIS purports to minimize the collision risk by pointing to a study by Madsen et.al. in 2012 that showed a 99% avoidance when turbines were spaced greater than 0.6 miles. The avoidance rate used in the DEIS is not well defined but it appears to be the probability that the bird will avoid the entire wind complex this needs to be clarified. But that study was for a particular bird species (the common elder) and a much smaller wind complex that it was able to fly around which the modeling then depicted. In the case here the piping plover considering both the Ocean Wind and the Atlantic Shores projects faces a 32-mile long barrier to making landfall. In addition the turbines proposed off LBI are much more powerful and carry greater pressure changes and turbulence one cannot just take results from small turbines and assume they hold for large ones. In addition that study did not show the collision risk to those birds that entered the wind complex which is the critical issue here facing the piping plover as well as the red knot. Further that study was for much smaller turbines with much different pressure and turbulence characteristics than the larger turbines proposed here. Finally it is unclear whether the piping plover has similar avoidance traits as the elder bird. Therefore the relevance of that study to the situation facing the piping plover is highly questionable. And there are other studies as shown below that present a much different and much	The PEIS paragraphs in which the Madsen et al. (2012) paper is referenced are concerning adverse impacts of additional energy expenditure due to minor course corrections or complete avoidance of offshore wind lease areas, not collision risk; this discussion is a general one and does not focus on any one bird species in particular. Madsen et al. (2012) examined the number of birds flying through the wind farm through the spacing between turbines, not around the entire wind farm, which is clearly stated in the PEIS. Additionally, although data on only the common eider was collected, the model simulations explored permeability scenarios to account for bird species with various levels of wind farm avoidance. Although WTGs to be used in lease areas on the Atlantic OCS (including the NY Bight lease areas) are expected to be larger, may result in greater pressure changes and turbulence than smaller turbines, and may be greater in number than the wind farm from which data was collected in the Madsen et al. (2012) study, the spacing between the WTGs will also be greater. As stated in the PEIS, “The 0.6- to 1-nautical mile (1.1- to 1.9-kilometer) spacing estimated for most structures that will be proposed on the Atlantic OCS is greater than the distance at which 99 percent of the birds passed through in the model.” In addition, Vattenfall (2023) recently studied bird movements within an offshore wind farm. The study was robust in that

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	greater risk to the plover which should have been presented in the draft EIS. In either case the BOEM cannot assume a 99 percent turbine avoidance by simply referencing studies which reference other studies which in turn are based on much smaller turbines (e.g. 216-foot diameters) other bird species and different circumstances. On its face it does not seem at all realistic to expect a small bird to easily and often escape multiple rows of rotating turbine blades with diameters more than two football fields long a rotor swept area 13 times that used in previous studies and wind tip speeds approaching 200 miles an hour causing significant disruptions in air currents. Prior studies (PP2) acknowledge that the avoidance rate for the piping plover is simply not known. If the BOEM uses an avoidance percentage number it needs to provide a plausible explanation for it. Otherwise it should be conservative in its analysis. If the avoidance percentage is of the entire complex then the assumption of 99 percent avoidance is especially unfounded when we know historically that the piping plover's instincts are driving it towards its nesting ground on the Island and the direct path from its migratory routes to it is through the wind complex. There seems no basis to assume it will go tens of miles out of its way from that direct path to get there. So the avoidance rate is likely to be closer to zero than it is to 99 percent. Rather for a bird approaching these large turbines and their aerodynamics suggest otherwise. First it is not clear that the bird can even detect the rotating blades especially the outer part which are now moving at very high speeds. This causes vision blur and paradoxically is now greater with a larger turbine again because of their outward tip speeds approaching 200 miles an hour. If the bird does detect an obstacle and tries to change course there are additional difficulties. If it is approaching the turning blades against the wind it will experience a very significant pressure drop in front of the blades which will suck it in to the blade swept area. If it is approaching the turning blades with the wind behind it and seeks to change course it has the counter that wind speed which is likely to be significant during operation of the turbine. If it passes through the swept area it will experience that same pressure drop behind the blades. All of this suggests that a 99 percent avoidance through	seabirds were tracked inside the array with video cameras and radar tracks, which allowed for measuring avoidance movements with high confidence and at the species level. The study concluded that seabirds would be exposed to very low risks of collision in offshore wind farms during daylight hours. This was substantiated by the fact that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the 2 years of monitoring. Refer to response to comment BOEM-2024-0001-0400-0022. Impacts on federally listed threatened and endangered birds (including piping plover) are addressed in more detail as part of BOEM's consultation with the USFWS on a Programmatic Framework ESA Section 7 consultation, which was initiated on June 20, 2024. The Programmatic Framework ESA Section 7 consultation considers collision risk for the piping plover and other ESA-listed bird species using Stochastic Collision Risk Assessment for Movement (SCRAM) models. The final report on the SCRAM model (Adams et al. 2022) is available at https://espis.boem.gov/Final%20Reports/BOEM_2022-071.pdf. SCRAM uses bird passage rates based on modeled flight paths of birds fitted with nanotag transmitters, rather than avoidance rates (Gilbert et al. 2022). Estimates of bird collisions will be part of the consultation.

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	multiple rows of such situations is completely arbitrary and the BOEM needs to go back and present something realistic.	
BOEM-2024-0001-0357-0053	It is not known if the BOEM is using the "BAND" model in its Biological Assessment (BA) to analyze collision risk as the bird goes through the wind complex. The description of the BAND model in other literature as a "static" model indicates that it scores a collision only when a bird actually hits a blade. The blades are relatively thin and the area occupied by the blades compared to the entire area swept by the rotation is very small so obviously using only that the risk of collision will be small. This does not account for the risk of injury or fatality from the extreme turbulence and pressure changes that the bird would experience as it passes through the rotor swept area and beyond it especially just downwind of the turbine. It ignores all the turbulence pressure changes and wind shear effects occurring in between and downwind of the blades which could also maim or kill a bird. Any use of the model without modification would seems especially inappropriate considering the huge 110-meter blade length and blade tip tangential speeds approaching 200 miles per hour. The BOEM needs to do a current realistic assessment of the risk of injury and fatalities here in its BA. It cannot rely on the BAND model as it did for the Vineyard Wind 1 Biological Assessment based on the model's limitations described above and other major drawbacks expressed by the U.S. Fish and Wildlife Service PP3. Collision Risk Models (CRMs): we expect that BOEM will apply CRMs to evaluate avian impacts in its BA. While limited CRMs are one of the only tools available to hypothesize potential impacts to birds from collision in the offshore environment. As such CRMs provide a mechanism for testing outcomes (e.g. observed collision rates) against the model predictions (e.g. expected collision rates) and BOEM must address the need to collect the data necessary to test these hypotheses. The DEIS should include a CRM-driven collision risk analysis for all species of conservation obligation which may occur within 20 km of the Atlantic Shores footprint and for which a current CRM would be appropriate even if the species has not been documented within the footprint. This should include a recent stochastic derivation of the Band model such as the McGregor (2018) version [Footnote 1: McGregor RM King S Donovan CR Caneco B	Collision risk for the piping plover, red knot, and roseate tern is addressed using the SCRAM model as part of the Programmatic Framework ESA Section 7 consultation that BOEM initiated with USFWS on June 20, 2024. The SCRAM model is specific to offshore wind on the U.S. Atlantic Ocean developed collaboratively between the USFWS, BOEM, University of Rhode Island, and Biodiversity Research Institute. Descriptions of the SCRAM model and limitations can be found in the final report on the model (Adams et al. 2022), which is available at https://espis.boem.gov/Final%20Reports/BOEM_2022-071.pdf. For all non-ESA listed bird species, BOEM anticipates NY Bight lessees would submit bird risk assessment information similar to that used for previous COP-specific NEPA reviews. The PEIS references two such documents from previous and adjacent lease areas—Empire Wind OCS-A 0512 and Ocean Wind 1 OCS-A 0498. As stated in the PEIS Section 3.5.3.4.1, the majority of the bird species identified in the impact assessments for these two lease areas are expected to have “minimal” to “low” overall exposure risk. Further, coastal birds are considered to have minimal exposure (occurrence) within the NY Bight lease areas because they are far enough offshore to be beyond the range of most breeding terrestrial or coastal bird species. Regarding Collision Risk Model daytime and nighttime flight patterns, SCRAM indirectly accounts for daytime and nighttime activity by using monthly averages of wind speed and turbine operation as inputs. If there was sufficient information about the timing of bird migration and what the turbines are doing during the same time frame, then the results would more directly reflect bird behavior with the operation of the wind farm. For instance, if most of the birds migrate between one hour before sunset and two hours after sunset, then BOEM would need information of what the turbines are likely to be doing during that time.

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	Webb A. 2018. A Stochastic Collision Risk Model for Seabirds in Flight:61. https://tethys.pnnl.gov/sites/default/files/publications/McGregor-2018-Stochastic.pdf.]. BOEM must be transparent in its CRM application. These models are extremely sensitive to the input parameters. A study by Cook et al. (2014) found that estimations of avoidance and collision risk from Band models were highly sensitive to the flux rate (total number of birds passing through the wind farm) corpse detection rate rotor speed and bird speed. Factors such as weather (i.e. wind speed and visibility) and habitat use would also affect the accuracy of these estimates as such factors would greatly influence avian flight patterns and behavior [Footnote 2: Cook ASCP Humphreys EM Masden EA Burton NHK. 2014. The Avoidance Rates of Collision Between Birds and Offshore Turbines. Scottish Marine and Freshwater Science 5:263. 62]. Therefore the Draft EIS must provide the inputs used in its analysis for public comment and transparency. Providing CRM results without transparency to the inputs and analytical process would never be acceptable from a scientific perspective and therefore should not be acceptable from BOEM. Providing inputs would show whether BOEM followed the guidance provided by Band in assessing collision risk. These details regarding inputs should include but not be limited to avoidance behavior flight height flight activity flux rate corpse detection rate rotor speed bird speed and collision risk. Additionally CRMs should consider differences in daytime and nighttime flight patterns. As Band himself stipulates: For some species typical flight heights are dependent on the season and in such a case it will be best to use seasonally dependent typical flight heights in assessing collision risk for each month rather than average flight heights across the year...Flight activity estimates should allow both for daytime and night-time activity. Daytime activity should be based on field surveys. Night-time flight activity should be based if possible on nighttime survey; if not on expert assessment of likely levels of nocturnal activity...collision model[s] should take both day and night flights into account. Where there is no night-time survey data available or other records of nocturnal activity for the species in question (or for other sites if not at this site) it should be assumed	

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	that the Garthe and Hppop/ King et al. 1-5 rankings apply. These rankings should then be translated to levels of activity at night which are respectively 0% 25% 50% 75% and 100% of daytime activity. These percentages are a simple way of quantifying the rankings for use in collision modelling and they may to some extent be precautionary [Footnote 3: Band B. 2012. Using a collision risk model to assess bird collision risks for offshore windfarms. SOSS report for The Crown Estate Norway. https://www.bto.org/sites/default/files/u28/downloads/Projects/Final_Report_SOSS02_Band1ModelGuidan ce.pdf.]. There are new derivations of the Band model under development namely the 3-D CRM for seabirds by the Shatz Energy Research Center [Footnote 4: Seabird Distribution in 3D: Assessing Risk from Offshore Wind Energy Generation Shatz Energy Research Center (2020) https://schatzcenter.org/2020/04/seabird3dstudy/.] and stochastic CRM specific to ESA-listed species in southern New England from the University of Rhode Island [Footnote 5: Transparent Modeling of Collision Risk for Three Federally-Listed Bird Species to Offshore Wind Development US Fish and Wildlife Service with University of Rhode Island (Oct. 29 2020) https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/Transparentmodeling-of-collisionrisk-for-three-federally-listed-bird-species-to-offshore-wind-development_1.pdf.].	
BOEM-2024-0001-0357-0054	BOEM Cannot Assume that Larger Turbines Further Apart Reduces Risks to Birds There is no substantial evidence to suggest that larger turbines spaced farther apart reduces risks to birds and it should be a goal of BOEM to understand the effects of displacement and mortality relative to turbine size and spacing. The size of turbines has grown substantially over the past decade and this trend is expected to continue. In its Vineyard Wind 1 project Vineyard Wind plans to use GE's 12 MW Haliade-X turbine which has a 220-meter rotor swept zone and is estimated to reach a maximum height of 260 meters above sea level. University of Virginia is currently developing 200-meter-long blades to power a 50-mw turbine with a potential rotor swept zone of approximately 400 meters. Given that the tower height would need to be more than 200 meters in height to	As stated in the PEIS, the effects of offshore wind farms on bird movement ultimately depends on the bird species, size of the offshore wind farm, spacing of turbines, and extent of extra energy costs incurred by the displacement of flying birds (relative to normal flight costs pre-construction) and their ability to compensate for this degree of added energy expenditure. Little quantitative information is available on how offshore wind farms may act as a barrier to movement, but there are some studies that provide information on bird movement through offshore wind farms. One study cited in the PEIS is Madsen et al. (2012), which found that increased turbine spacing coincided with increased numbers of birds flying through the wind farm. Further, Vattenfall (2023) recently conducted a robust study of bird

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	accommodate rotor blades of this size turbines could soon reach heights greater than 400 meters above sea level. Studies Karas (2009) [Footnote 6: Smallwood KS Karas B. 2009. Avian and Bat Fatality Rates at Old-Generation and Repowered Wind Turbines in California. The Journal of Wildlife Management 73:10621071.] and Johnston et al. (2014) [Footnote 7: Johnston A. A.S.C.P. Cook L.J. Wright E.M. Humphreys and N.H.K. Burton. 2014. Modeling Flight Heights of Marine Birds to More Accurately Assess Collision Risk with Offshore Wind Turbines. Journal of Applied Ecology 51 31-41.] which suggest that fewer larger turbines reduce avian collision risk are based on turbines less than 5 mw. As turbines increase in size they are more likely to encroach on airspace occupied by nocturnal migrants [Footnote 8: Id. 64 bird species.] while not necessarily avoiding airspace occupied by relatively lower flying foraging marine. Conversely studies by Loss et al. (2013) Choi et al. (2020) and Huso et al. (2020) find that bird deaths not only increase with turbine size but also suggest that the number of bird deaths from collision with wind turbines is proportional to the number of mw produced in a wind farm. Turbulence above and below the rotor swept zone can affect flight performance. If this should make birds more susceptible to physical interactions with turbines then larger turbines would only increase that risk. Additionally limiting risk evaluations to the rotor swept zone neglects the risk of collision from the tower itself and turbulence around the rotor swept zone. Suggestions that increased spacing (1 nm) between turbines would reduce risks to birds from both collision and displacement is unfounded as offshore wind farms in Europe do not provide this level of spacing and therefore there is no operational comparison to be made. Instead increased spacing means fewer turbines and less energy production within the footprint of the project so more projects (and more space) will be necessary to meet state and national energy goals. Furthermore greater space between turbines may increase collision risk if species vulnerable to collision end up using the wind farm more frequently. Unfortunately these are all unknowns and BOEM will need to fund studies to answer these questions. The Draft EIS should have included a risk assessment considering the full range of the potential rotor swept zone provided in the COP to assess 1) impacts from	movements within an existing offshore wind farm. The study tracked seabirds inside the array with actual video cameras and radar tracks, which allowed for measuring avoidance movements with high confidence and at the species level. The study concluded that seabirds would be exposed to very low risks of collision in offshore wind farms during daylight hours. This was substantiated by the fact that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the 2 years of monitoring. Refer to response to comment BOEM-2024-0001-0400-0022. Aside from the few studies that are available on this matter, BOEM still maintains that bird presence on the Atlantic OCS is low based on the literature, studies, and other information documented and described in PEIS Section 3.5.3. As such, BOEM anticipates the risk to birds from any offshore IPF is low (even accounting for turbine spacing and size). For risk to federally listed threatened and endangered birds from offshore wind turbines, refer to responses to comments BOEM-2024-0001-0357-0051 and BOEM-2024-0001-0357-0053. Regarding unknowns and data gaps on birds' use of the of offshore environment, refer to response to comment BOEM-2024-0001-0400-0003. The lessees would need to comply with the Migratory Bird Treaty Act.

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	collision and barrier effects to migrating birds including the piping plover and 2) potential increased habitat loss that may need to occur. Similarly the federally threatened and State endangered red knot is likely crossing the lease area as well and a similar analysis should be done for it. It has a critical habitat in the Holgate and North Brigantine areas during its fall migration (PP4). The results of all Atlantic Shore's Phase 1 and subsequent studies of its migration routes should have been included in the DEIS. The list of project authorizations should also include compliance with the Migratory Bird Protection Act and the criteria used to determine that.	
BOEM-2024-0001-0423-0012	Birds/Bats The Draft PEIS notes the stressors that birds are experiencing including vulnerability to sea level rise and the increasing frequency of strong storms resulting from global climate change (page 3.5.3-11) and commercial fisheries by-catch (page 3.5.3-2 notes that approximately 2600 seabirds are killed annually on the Atlantic through commercial fishing activities). In addition to these stressors climate change is causing more intense droughts increasingly frequent wildfires mismatches between food supplies and migration times which impact bird habitat and migrations. The Draft PEIS meaningfully understates the beneficial effects from the six NY Bight projects since birds would benefit from the resulting reduction in climate change impacts that would occur when the six projects are in operation and producing renewable energy. This benefit may be difficult to quantify but qualitatively it would be expected and should be noted. The Draft PEIS states that [italicized: "potential impacts on birds within the NY Bight lease areas under six projects is not anticipated to be different compared to a single NY Bight project"] (Section 3.5.3.5.2 page 3.5.3-28) and that [italicized: "the incremental impacts contributed by Alternative C to the cumulative impacts on birds would be almost undetectable"] (Section 3.5.3.5.5 page 3.5.3-29). Yet the AMMMs for birds would still require extensive monitoring and reporting burdens with open- ended requirements for plan revisions. These AMMMs are duplicative as bird and bat monitoring requirements will come out of the ESA Section 7 consultation process	As stated in PEIS Section 3.3.2, some impacts of the NY Bight projects may not be measurable at the programmatic level, such as the beneficial impacts on climate change due to a reduction in greenhouse gas emissions. Beneficial impacts on climate change may be addressed in the COP-specific NEPA review document. The minimal difference in bird impacts under six projects and one project—and the impacts anticipated to be undetectable in the context of cumulative impacts—is primarily based on the current understanding that bird presence in the offshore environment is low. If bird presence is low, then there is unlikely to be any notable difference between one project and six projects because neither would have notable effects on bird populations. However, AMMM measures are still implemented by BOEM because there still is some level of uncertainty on the distribution and habitat use of birds in the offshore environment (refer to response to comment BOEM-2024-0001-0400-0003), and implementation of AMMM measures will improve the understanding of bird interactions with offshore wind farms and help inform the assessment of potential impacts on birds from construction and operation of offshore wind farms.

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	during the project-specific NEPA reviews. A PEIS that requires such monitoring frameworks in a COP puts the cart before the horse.	
BOEM-2024-0001-0450-0004	Avian Recommendations- Integrated Monitoring Systems: BOEM should require the deployment of integrated multi- sensor systems at project substations and selected turbines to improve avian impact detection and identification. This would enhance monitoring capabilities and allow for better estimation of collision and avoidance rates.- Adaptive Monitoring Plans: BOEM should require comprehensive monitoring plans that adapt to new information and technology. This includes reporting requirements to enable adjustments to monitoring approaches and consideration of new technologies or additional monitoring periods ensuring the effectiveness of mitigation measures.- Cumulative Impacts Assessment: BOEM should conduct a thorough assessment of cumulative impacts on marine and migratory birds across multiple spatial scales. This would involve considering non-Endangered Species Act (ESA) listed bird species in tracking studies focusing on larger-bodied species for large-scale assessments and transparently discussing poorly- understood areas of avian risk.	BOEM recognizes that monitoring and reporting after construction may be necessary. Based on COP approvals to date, BOEM anticipates monitoring and reporting may be part of the terms and conditions of future COP approval for any of the NY Bight lease areas, as well as adaptive management if impacts deviate substantially from the impact analysis in the EIS. BOEM anticipates that there will be technical innovations to sensor systems in the near future. The PEIS addresses cumulative impacts for the No Action Alternative, Alternative B, and Alternative C (see PEIS Sections 3.5.3.3.3, 3.5.3.3.4, 3.5.3.4.4, 3.5.3.4.5, 3.5.3.5.4, and 3.5.3.5.5). These assessments are based on the best available information regarding bird use on the Atlantic OCS and potential risk from offshore wind projects, as documented in PEIS Section 3.5.3. BOEM understands there are data gaps, uncertainties, and incomplete and unavailable information. However, as stated in PEIS Appendix E, BOEM concludes the PEIS is sufficient to support sound scientific judgments and informed decision-making and does not believe that there is incomplete or unavailable information on birds that is essential to making a reasoned choice among alternatives (refer to response to comment BOEM-2024-0001-0400-0003 and PEIS Appendix E for more information on this matter). In addition, COP specific NEPA documents for NY Bight lease areas that might be developed in the future would include project-specific bird information and cumulative effects analyses based on the most current and relevant bird information available at that time. Tracking studies of large-bodied birds for large scale assessments is something BOEM will consider.
BOEM-2024-0001-0450-0020	Avian Cumulative Impacts Analysis The cumulative impacts must be assessed with great care and focused purpose. This is especially true for marine birds and offshore migrating bats as their year-round ecological needs and conservation risks are fundamentally transboundary in nature. *[Footnote 84: Jodice PGR Suryan RM. 2010. The transboundary nature of seabird ecology. In: Trombulak SC*	Refer to response to comment BOEM-2024-0001-0450-0004. In addition, the PEIS cumulative effects analysis accounts for all anticipated offshore wind projects along the Atlantic OCS that are in the geographic analysis area for birds (with an estimated 2,459 WTGs), and not just in lease areas adjacent to the NY Bight lease areas (see all wind projects in PEIS Figure 3.5.3-1), as well as other planned non-offshore-wind activities that may affect birds

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	Baldwin RF (eds) Landscape- scale conservation planning. Springer Dordrecht pp 139165.] Whereas the mitigation and monitoring approaches in many instances are responsive to wildlife concerns in the NY Bight PEIS we believe the attention devoted to cumulative impacts should be improved. The six lease areas in the NY Bight are configured such that at least three spatial scales would need a cumulative impacts analysis for birds. These include (1) the impacts of each individual lease area relative to the most proximate or adjacent lease area(s) (e.g. OCS-A 0541 and OCS-A 0542); (2) the contribution of each cluster of lease areas to each other (e.g. OCS-A 0541/0542/0539/0538 and OCS-A 0512/0544); and (3) the contribution of any individual lease and all six new lease areas to other adjacent wind areas spread along the Atlantic seaboard of the U.S. In each case the cumulative impacts of the NY Bight PEIS should address marine and migrant birds as well as bats within a hierarchical multi-scale framework. *[Footnote 85: This approach should be similar to that used by Garthe S Schwemmer H Peschko V Markones N Mller S Schwemmer P Mercker M. 2023. Large-scale effects of offshore wind farms on seabirds of high conservation concern. Scientific Reports 13: 4779. In that study cumulative impacts were examined for loons (Gavia stellata G. arctica) in a large area of the North Sea consisting of 14 offshore wind farms organized into 5 wind farm clusters. Displacement impacts were examined at multiple scales including within the wind farms out to 1 km zones and out to 10 km zones.]* For cumulative effects analyses it is especially important to consider widespread non-ESA listed bird species in potential tracking studies to detect how avoidance attraction collision risk and displacement may occur for birds throughout the NY Bight PEIS project and adjoining lease areas. The focus for species selection might rely on project-site surveys in aggregate or the MDAT data but preferably both. Cross- project tracking studies could build on previous work that identifies the most susceptible species of marine birds *[Footnote 86: Marques AT Batalha H Bernardino J. 2021. Bird displacement by wind turbines: assessing current knowledge and recommendations*	(see PEIS Appendix D for a description of planned activities). As stated in PEIS Section 3.5.3, given that the abundance of bird species that overlap with wind energy facilities on the Atlantic OCS is relatively small (see PEIS Figure 3.5.3-2), offshore wind activities would not appreciably contribute to impacts on bird populations.

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	for future studies. Birds 2:460475.] ones that are also sufficiently widespread throughout the NY Bight. Larger-bodied species of birds can make superior focal subjects for large-scale cumulative impacts assessment *[Footnote 87: Garthe et al. 2023.]* and for determining optimal locations to monitor and mitigate bird populations affected by offshore wind in a regional context. Other avian candidates for monitoring objectives in cumulative impacts assessments can be selected from species designated as having higher exposure scores or higher collision vulnerabilities from offshore wind projects along the Atlantic seaboard. *[Footnote 88: Robinson Willmott JC Forcey G Kent A. 2013. The Relative Vulnerability of Migratory Bird Species to Offshore Wind Energy Projects on the Atlantic Outer Continental Shelf: An Assessment Method and Database. Final Report to the U.S. Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs. OCS Study BOEM 2013-207. 275 pp.]* Finally we strongly recommend more transparent discussion of poorly-understood subject areas where minimal risk to birds is now assumed based merely on limited knowledge or high uncertainties. This includes effects of low frequency sound (infrasound) during turbine operations a factor that could potentially interfere with avian navigation. *[Footnote 89: Patrick SC Assink JD Basille M Clusella-Trullas S Clay TA den Ouden OF Joo R Zeyl JN Benhamou S Christensen-Dalsgaard J Evers LG. 2021. Infrasound as a cue for seabird navigation. Frontiers in Ecology and Evolution 9:812.]* Indirect effects to marine birds from prey redistribution should be incorporated into adaptive monitoring frameworks. Removal of existing hard and/or soft bottom substrates or replacing them with vertical structures that act as artificial reefs could lead to ecosystem-scale alterations to fish and invertebrate prey resources *[Footnote 90: Methratta ET Dardick WR. 2019. Meta-analysis of finfish abundance at offshore wind farms. Reviews in Fisheries Science & Aquaculture 27:242260; Perry RL Heyman WD. 2020. Considerations for offshore wind energy development effects on fish and fisheries in the United States. Oceanography 33:2837.]* thereby influencing avian habitat use and energetics around wind farms. *[Footnote 91: Ronconi*	

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	RA Allard KA Taylor PD. 2015. Bird interactions with offshore oil and gas platforms: Review of impacts and monitoring techniques. Journal of Environmental Management 147:3445; Dierschke V Furness RW Garthe S. 2016. Seabirds and offshore wind farms in European waters: Avoidance and attraction. Biological Conservation 202:5968.] Whether such effects are positive negative or neutral they should be evaluated within the NY Bight PEIS adaptive monitoring frameworks	

P.5.8 Coastal Habitat and Fauna

Table P.5-8. Responses to Comments on Coastal Habitat and Fauna

Comment No.	Comment	Response
BOEM-2024-0001-0063-0001	Environmental Disruption: The installation and operation of turbines in the New York Bight will disrupt the marine ecosystem potentially harming habitats and affecting the behavior of marine life.	Thank you for your comment.
BOEM-2024-0001-0122-0002	Additionally ecological changes and alterations to the local marine ecosystem raise environmental concerns that necessitate careful consideration. The devasting impact this will have on bird and bat mortality as well as the visual and noise impact on residents further contribute to the argument against wind turbines in the region. These concerns coupled with the possible negative effects on property values. Offshore wind turbines will have a negative impact on ecosystems industries and communities. We must not allow this to move forward!	Thank you for your comment. Impacts on birds and bats are analyzed in Sections 3.5.3 and 3.5.1, respectively. The visual impacts are analyzed in Section 3.6.9.
BOEM-2024-0001-0313-0048	Affected Environment and Environmental Consequences 3.5.4-14 The PEIS states "Temporary construction impacts on coastal fauna would be limited (see noise and traffic IPFs) as most individuals would avoid the construction areas (Goodwin and Shriver 2010). Land disturbance that does occur especially on shoreline parcels could cause short-term erosion and sedimentation impacts in coastal habitat. Altering dune and beach habitat could increase erosion and sedimentation because dune habitat serves as a crucial buffer zone against flooding. Federal and state agencies work with Atlantic coastal towns and other land managers to develop site-specific Beach Management Plans for the protection of federally and state-listed threatened and endangered species. The COP NEPA analysis	The project-specific COP-level NEPA analysis will coordinate with local towns and beach managers once the landing locations are identified to ensure consistency with relevant local management plans.

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	will coordinate with local beach managers once the landing locations are identified to ensure concurrence with local Beach Management Plans. Overall impacts from land disturbance on coastal habitat and fauna are expected to be minor." Comment DER is unaware of the existence of the aforementioned Beach Management Plan or the Federal and State government efforts to provide resources regarding same further it is all but certain that any plans for TOBAY Beach did not have any considerations for the impacts from offshore wind. Further any impediments to the shore as referenced above should be completely avoided where feasible especially where it could impact access to the Town's beachfront community and enjoyment of local resources and could impede environmental improvement measures regularly deployed by the Town such as dune grass planting.	
BOEM-2024-0001-0394-0003	Many forms of aquatic marine life have evolved to be highly dependent on sound because vision underwater is only useful for perceiving very short distances. Many forms of aquatic ocean life are only able to understand perceive or 'image' their environment using sound. The effects of sound on marine organisms is not receiving a proper examination. For most marine organisms use of and response to sound is necessary for the execution of essential life processes. For some vibration. The U.S. Offshore Wind program will make profound modifications to a very large portion of the ocean habitat on the outer continental shelf. The examination performed by BOEM and NOAA Fisheries has largely been focused on whether sounds expected to be generated by offshore wind activity are expected to be loud enough to cause permanent hearing losses. The scope so narrow that it will not be able to capture the environmental effects of this project that are reasonably likely to occur.	Noise is an IPF analyzed throughout the PEIS. The impacts of noise on coastal fauna are discussed for all alternatives in Section 3.5.4. The behavioral impacts of noise on species are further discussed in the corresponding sections for marine mammals, sea turtles, birds, bats, benthic resources, and finfish and invertebrates.

P.5.9 Finfish, Invertebrates, and Essential Fish Habitat

Table P.5-9. Responses to Comments on Finfish, Invertebrates, and Essential Fish Habitat

Comment No.	Comment	Response
BOEM-2024-0001-0071-0002	Through noise pollution (I was part of a study that tested noise levels at VW construction as loud as 181dbs WAY TOO LOUD) through EMFs (we'll literally be putting radiant heat in our ocean floors) through the substations that will suck up 8000000 gallons of water each and heat it up to as high as 93*F cooking and killing plankton microbes and fish larvae through oil spills and through endangering migrating birds and bats. We will be endangering our natural food supply.	BOEM is analyzing several AMMM measures under Alternative C, including measures to reduce decibel (dB) levels using attenuation devices and shut-off protocols when animals are within the vicinity of sound sources. The design, location, construction, and capacity of the cooling water intake structures shall reflect the best technology available for minimizing adverse environmental impacts from the impingement and entrainment of all life stages of fish (e.g., eggs, larvae, juveniles, and adults) by the cooling water intake structures. Examples of RPs for noise include MUL-5, MUL-6, and MUL-7, including implementation of lowest noise practices for equipment, WTG installation methods, and adherence to International Maritime Organization (IMO) guidelines on vessel noise, which would reduce impacts from noise on finfish, invertebrates, and EFH.
BOEM-2024-0001-0093-0002	I believe that the wind turbines will encourage new habitats for fish life.	Thank you for your comment. You can read more about the reef effect in the Presence of Structures subheadings within Sections 3.5 and 3.6.
BOEM-2024-0001-0122-0004	Marine Ecosystem Disruption: The installation of offshore wind turbines will disturb marine ecosystems. Construction activities such as pile driving will create noise and vibrations that affect marine life and the presence of underwater structures can alter the behavior of marine species.	The impact of pile-driving on multiple species is discussed in Table 2.4 and Section 3.5. Acoustic thresholds are analyzed for multiple species. There are several AMMM measures that can be applied during pile-driving activities to address underwater noise.
BOEM-2024-0001-0176-0002	This push for Offshore Wind is nothing more than a massive experiment on our ocean and the entire marine ecosystem. Cooling systems taking in cool ocean water at up to 8100000 gallons per day and mixing it with chemicals such as bleach to keep the pipes clean and then dumping it back into the ocean at temp. between 86-90 degrees F. this will certainly mimic climate change kill off fish larvae zooplankton etc.	The analysis of warm water discharges from the offshore substations is included in Section 3.4.2. Warm water discharged from the offshore substations will have a minimal effect because it will be mixed by the surrounding water and returned to ambient temperatures. The overall impacts are expected to be minimal with no degradation of water quality. CWA Section 316(b) requires project-specific NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts. The design, location, construction, and capacity of the cooling water intake structures

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		will incorporate the best technology available for minimizing adverse environmental impacts from the impingement and entrainment of all life stages of fish (e.g., eggs, larvae, juveniles, and adults).
BOEM-2024-0001-0308-0001	The construction of wind turbines in the New York Bight poses a significant threat to the marine ecosystem particularly affecting numerous whale and fish species that frequent this area as reported by Gotham Whales. This includes several endangered species highlighting the critical nature of the threat.	BOEM has previously required developers to use protective measures—such as protective species observers, exclusion zones, and independent reporting,—to avoid whales and other protected species during project activities. A full list of measures aimed at protecting finfish, invertebrates, and EFH can be found in Table 3.5.5-8. Measures protecting marine mammals and sea turtles can be found in Tables 3.5.6-11 and 3.5.7-8, respectively.
BOEM-2024-0001-0313-0019	There are numerous concerns with the potential impacts of the open loop system mentioned above including the intake of phytoplankton and larvae that form a basis for the ocean food chain and the cascade of potential adverse effects. Again the concern and analysis should not be limited to just the NY Bight Area but the impact of the loss of the organisms and food supply in terms of the cumulative impacts for this technology for all the planned and future offshore wind projects in the sphere of ecological influence. Even the PEIS makes note on page 3.4.2-3 that "Phytoplankton is the foundation of the marine food web and their associated growth rates depend on nutrient (e.g. nitrogen phosphorus and carbon plus calcium and silicon are various micronutrients) availability in the water." Thus the impact to other trophic levels given the potential impact to the foundational structure of the marine food web should be analyzed.	Section 316(b) of the Clean Water Act requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impact from impingement and entrainment of aquatic organisms. Impacts of entrainment and impingement on finfish and invertebrates at HVDC converter intakes would be limited to the immediate area of the offshore substations and to intake volumes. Project design and specific intake volumes will be assessed in the NEPA analysis of each project-specific COP.
BOEM-2024-0001-0313-0044	Further there should be a quantification of the cumulative impacts of all project impacts to loss of filter feeding organism in terms of not just loss to commercial harvesting but in terms of water quality benefits correlated to the societal economic impact to decreased water quality as result of the proposed action. Estimating the dollar value of water quality benefits currently provided in the no action alternative as compared to the proposed action requires a multidisciplinary approach. A new study estimates that oyster and clam aquaculture provides $2.85.8 million in services that remove excess nitrogen from the coastal waters of Greenwich Connecticut. The study was conducted by shellfish biologists economists and	Section 3.6.1.5.1 provides an assessment of shellfish, including AMMM measure COMFIS-3, which proposes the development of a Fisheries and Benthic Monitoring Plan, which would include surfclam and scallops and would be compatible with other regional data collection methods. This measure, if applied, would increase data and knowledge about the surfclam and scallop fishery, potentially resulting in the future development of other mitigation measures that may benefit those or other commercial or for-hire recreational fisheries.

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	modelers from NOAA Fisheries NOAA National Centers for Coastal Ocean Science and Stony Brook University. It was recently published in Environmental Science & Technology. Researchers used a "transferable replacement cost methodology" to estimate the ecological and economic value of nitrogen reduction that results from oyster and clam aquaculture in this coastal community. The replacement cost method puts a dollar value on ecosystem services by estimating what it would cost for humans to provide those services." (Source: NOAA Fisheries "How Much Is A Clam Worth To A Coastal Community?" April 05 2021). As the proposed action has the significant potential to dramatically reduce the filter feeding capacity of destroyed filter feeding organisms this should be analyzed and a compensation package and/ mitigation measures and plan for restoring what is lost should be provided if warranted in the PEIS.	
BOEM-2024-0001-0313-0047	Affected Environment and Environmental Consequences 3.5.2-15 The PEIS states "Electric and magnetic fields and cable heat: EMF would result from ongoing and planned transmission or communication cables. DC cables placed on the seafloor would generate a static magnetic field changing the natural geomagnetic field. Cables carrying AC which produce low-frequency EMF are the most commonly used in offshore wind farms to date. EMF effects from offshore wind cables on benthic habitats would vary in extent and significance depending on overall cable length the proportion of buried versus exposed cable segments and project-specific transmission design (e.g. HVAC or HVDC transmission voltage). The EMF intensity diminishes rapidly with distance but is considered a long-term impact as it is expected to be present in the environment for the life of the project. The maximum magnetic field expected for an offshore wind energy project's export cable EMF is about 165 milligausses) (16.5 microteslas) dropping to 40 milligausses (4.0 microteslas) 3.26 feet (1 meter) above the cable a decrease in field strength of 76 percent (CSA and Exponent 2019). To put these values in perspective the strength of the Earth's DC magnetic field is approximately 516 milligausses (51.6 microteslas) along the southern New England Coast (CSA and Exponent 2019) and normal values of the Earth's geomagnetic field can range from 200 to 750 milligausses (20 to 75 microteslas) depending on the geographical location (Diez-	The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. An acknowledgment of uncertainty about the impacts of EMFs is included in Appendix E, *Analysis of Incomplete or Unavailable Information*. Future research about EMF exposure on benthic marine organisms may be incorporated into future project-specific COP NEPA analyses as information becomes available.

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	Caballero et al. 2022). At this time no thresholds of the acceptable or unacceptable levels of EMF emissions have been determined for the marine environment (Hogan et al. 2023). The impact of EMF on benthic habitats is an emerging field of study; as a result there is a high degree of uncertainty regarding the nature and magnitude of the effects on all potential receptors (Gill and Desender 2020). Recent reviews by Bilinski (2021) Gill and Desender (2020) Albert et al." Comment It is concerning that there is an admitted lack of scientific studies and evidence documenting the potential impacts to benthic organisms and the ecosystem as a result of EMF and cable heat. It would also stand to reason that the assumption should not be that there is no impact but should conversely be an assumption that there is an impact until proven otherwise in an abundance of caution to protect the environment.	
BOEM-2024-0001-0313-0058 and BOEM-2024-0001-0313-0059	Further, based on DER past experience, and comments from NYSDEC and responses from AECOM (source: Response to Comments Letter Dated: March 4, 2022 Technical Comment Letter South Brooklyn Marine Terminal – Port Infrastructure Improvements Project DEC ID: 2-6102-00120). • Protected Species Time of Year Restrictions (TOYRs) -The narrative recognizes the need for compliance with the TOYRs however TOYR dates are not specified. TOYRs also will apply for in-water work associated with bulkhead/wharf improvements (such any in-water vibratory pile driving). To avoid impacts to federal-and state-protected species including migrating Atlantic sturgeon and spawning winter flounder no in-water activity shall occur between: a. December 15 and March 1 in waters less than 20 feet; and b. March 1 and June 30 and between October 1 and November 30 in waters of any depth. ○ Response 2: Thank you for providing the TOYRs. The project will comply with these restrictions. • Protected Species Protection Measures -Please indicate the size of the buffer zone that would trigger a shut down if a protected species is observed (as discussed in Section 8.1 of the Permit Information Packet). Additionally please also include the	The PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lessee has the exclusive right to develop and submit a COP as outlined under 30 CFR 585.628. BOEM will then conduct project-specific COP NEPA analysis for each lease area that will focus on providing site- and project-specific analyses. Specific time of year restrictions for each project will depend on the proposed project activities and will be negotiated as part of the project permits.

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	Protected Species Shut Down buffer zone as a Best Management Practice to be implemented. ○ Response 3: As described in the JPA the likelihood that protected species would be present in the Project Area during in-water construction activities is extremely low. Based upon review of the NOAA Fisheries Final Biological Opinion for the New Jersey Wind Port dated February 25 2022 which required no buffer zone for similar in-water work and implementation of other conflict- minimizing Best Management Practices pile installation (e.g. operator will begin pile driving with soft start 'warning taps' piles will be vibrated in for the majority of the installation and then driven the remainder of the way) the Applicant believes that a shutdown buffer zone is not necessary. Based on prior experience with pile driving operations these BMPs would cause any protected species present to leave the action area prior to the production of maximum noise levels reducing the risk of injury. Pile driving at the start of each day would commence with an initial set of three strikes with the hammer operating at 40% power. After a one-minute pause two more sets of three strikes separated by a one-minute pause would be performed with the hammer operating at 40% power. After a third and final one-minute pause normal hammer operations would commence. Further pile installation will be limited to dates outside of sturgeon TOYR lessening the likelihood of potential impacts to sturgeon species." It is unclear if these restrictions will be in place for this project and if they have been factored in the construction schedule projections or if a waiver/permitting restriction relief will be sought from NYSDEC and what the consequences of same would be to the environment. AS this has the potential to impacts numerous project considerations this should be evaluated in the Final PEIS.	
BOEM-2024-0001-0332-0008	EFH Essential Fish Habitat The NYB leases are in the middle of the 20/30/40 fm midshore offshore fishing grounds which is some of the most productive	Impacts on sand lances and other fish are acknowledged in Section 3.5.5.1.4, *Essential Fish Habitat*. The addition of scour protection would result in short-term to permanent impacts on

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	fishing grounds and also home to a number of prominent/historic wreck sites. The area's sand ridges are home to abundant colonies of sand lance aka sandeels which are a quintessential link in the food web. They are not only forage to ground fish and pelagic species but also whales and sea birds. Anyone who has fished these waters in the summertime knows the show is better than Sea World! Based on documents which detail [Embedded Hyperlink: https://www.researchgate.net/publication/262875861_Short-_and_long-term_effects_of_an_offshore_wind_farm_on_three_species_of_sandeel_and_their_sand_habitat] the strong association of sand eels to sandy sediment sand eels will most likely be negatively affected by the radical change in habitats when hundreds of turbines and thousands of tons of rock scour protection are added around the turbine and substation bases. If and when sand eels leave so too do all of the other species.	softbottom habitat within the project area and would impart minor impacts on finfish, including the sand lance, though localized impacts would likely be greater. Habitat conditions would be unaffected after construction is complete. Impacts from six NY Bight projects would therefore remain negligible to major.
BOEM-2024-0001-0332-0009	How can it be that no HAPC (habitat areas of particular concern) are designated within the NYB yet summer flounder spawn in the winters on the OCS and use the areas during all four stages of their life cycle (egg larvae juveniles and adults)? Many other coastal species rely on the Chicken Canyon and Hudson Canyon during one or more life stages and use the NYB's lease areas. Also mako sharks should be of concern as they spend a lot of time in this area. As of 7/5/2022 U.S. fishermen may not land or retain Atlantic short fin mako sharks; however these water used to be prime shark fishing grounds. It seems many of these are conveniently overlooked. A lot of these ecologically sensitive area (what I would call HAPC) and fishing hot spots were detailed in the very basic early work of Buchanan at the NJDEP in 2010 NJ's Area of Interest Wind Power On The OCS. Was any of this really basic stuff even considered?	Habitat Areas of Particular Concern (HAPCs) are discrete subsets of EFH designated by the regional fishery management councils and represent high priority areas for conservation, management, or research, and they are necessary for healthy ecosystems and sustainable fisheries. The HAPCs for the study area are shown on Figure 3.5.5-2, along with the NY Bight lease areas. No designated HAPCs are located within the NY Bight lease areas; however, Section 3.5.5 discusses that summer flounder HAPCs may overlap with potential NY Bight offshore export cable corridors and vessel routes to the identified representative ports (see Chapter 2, *Alternatives*).
BOEM-2024-0001-0334-0005	Damage to the shoreline: Our fishermen are aware of catastrophic losses of sea scallop populations in the vicinity of sonar work. It has killed them. This outcome is unacceptable and BOEM has allowed it to happen.	AMMM measure COMFIS-3 is aimed to benefit the scallop fishery by focusing on increasing data and knowledge about the scallop fishery. See Table 3.6.1-20.
BOEM-2024-0001-0345-0012	CCE also makes the following suggestions for inclusion in the final document: Benefits of Offsetting Fossil Fuel Plants In addition to the benefits listed in the PEIS [Bold Italics: CCE urges BOEM to consider	Thank you for your comment. Assessment of impingement from the cooling systems of two existing onshore fossil fuel plants is outside the scope of this NEPA analysis.

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	the potential benefits of offsetting the need for the Northport Port Jefferson and E.F. Barrett power plants which are legacy fossil fuel power plants on Long Island.] During previous public meetings concerns were raised about the impact that the open-loop cooling systems of offshore wind farms will have on fish populations particularly Atlantic Cod. The Northport power plant which discharges directly into a marine environment (Long Island Sound) is responsible for the entrainment of almost 8.5 billion larvae and impingement of over 125000 fish each year. It is important for BOEM to note not only the potential adverse impacts of an offshore wind open loop system but to compare those impacts to the existing fossil fuel plants particularly the Northport and Barrett Plants that this project would reduce the need for.	
BOEM-2024-0001-0352-0010	In the finfish and EFH section Atlantic cod is referenced as a species that could benefit from increased hard bottom habitat resulting from project development. While we agree that it is important to ensure suitable habitats exist for Atlantic cod the New York Bight is not an important area for this species and the creation of new structures in this region may not confer a noticeable benefit. We remain concerned about the possible negative impacts of offshore wind construction on this species and we appreciate that acoustic impacts on cod and other fishes are discussed in this section. We are concerned that the discussion of open loop cooling systems underestimates potential effects on plankton including fish eggs and larvae (Section 3.5.2.4.1). For example the draft PEIS notes that discharge water for the South Coast project was predicted to reach 90F which is quite high. This was modeled to result in a 1.4 F increase up to 155 feet from the discharge point and was expected to result in mortality for many types of plankton. Impacts are described as negligible given that they are highly localized even when considered across all six New York Bight projects. It may not be appropriate to draw these conclusions without further consideration of the specific locations of these cooling systems within each lease area. We recommend a more detailed evaluation of this topic in the final PEIS and subsequent project-specific analysis.	Thank you for your comment. The estimated temperature and distribution of the discharge water provided from the predicted model developed by TetraTech and Normandeau Associates, Inc. in 2023 represents the current best available science. The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. An acknowledgement of uncertainty about the impacts of EMFs has been added to Appendix E, *Analysis of Incomplete or Unavailable Information*. Additional citations and clarifying text have been added to Final PEIS Section 3.5.5, *Impacts of the Proposed Action on Benthic Resources*, under *Presence of Structures*.

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	The draft PEIS seems dismissive of EMF impacts (Section 3.5.2.4.1). Given that large scale offshore wind projects are just now being installed off the East Coast this issue requires further study. We are also concerned that the draft PEIS downplays the potential for wind projects in these lease areas to result in expanding species distributions through the "steppingstone effect." The PEIS notes that wind projects in these lease areas may not notably contribute to the steppingstone effect given the existing network of artificial reefs off New York and New Jersey (Section 3.5.2.4.1). However the document fails to acknowledge that the six New York Bight lease areas are much further offshore than the existing artificial reefs. Fully built out along the East Coast offshore wind will result in a very large increase in artificial structures offshore that run from the seabed through the entire water column. Blue mussels for example may be demonstrating a steppingstone effect in the Block Island Wind Farm (Hogan et. al 2023[Footnote 2: Hogan F. B. Hooker B. Jensen L. Johnston A. Lipsky E. Methratta A. Silva and A. Hawkins (2023). Fisheries and Offshore Wind Interactions: Synthesis of the Science. 383p. https://repository.library.noaa.gov/view/noaa/49151] Section 1.1. and references therein).	
BOEM-2024-0001-0362-0026	Environmental Protection The draft PEIS reviews potential environmental impact from offshore wind development in the New York Bight and measures that could avoid minimize mitigate and monitor those impacts. The analysis explores potential impacts to bats benthic resources birds fish marine mammals sea turtles and wetlands. Environmental protection is a key requirement under the Outer Continental Shelf Lands Act (OCSLA) and NEPA and rigorous plans must be in place for offshore wind projects to comply with various state and federal statutes that projects are subject to. Offshore wind energy must be developed in an environmentally responsible manner that avoids minimizes and mitigates impacts to marine life and ocean users meaningfully engages stakeholders from the start and uses the best available science and data to ensure science- based and stakeholder-informed decision making. The PEIS should analyze potential cumulative impacts; benefits of mitigation measures; and adaptive management strategies. The analysis should include all relevant data and acknowledge relevant scientific	Thank you for your comment. The continuation of all other ongoing and reasonably foreseeable future activities described in Appendix D, *Planned Activities Scenario,* without the NY Bight projects, serves as the baseline for the evaluation of cumulative impacts. In Chapter 2, the impact of No Action Alternative; Alternative B, No Identification of AMMM Measures at the Programmatic Stage; and Alternative C, Identification of AMMM Measures at the Programmatic Stage, are discussed in light of the best available information. Incomplete or unavailable information (Data gaps) is described in Appendix Section E.1.7.

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	disagreements and data gaps. Avoiding sensitive habitat areas requiring strong measures to protect wildlife throughout each state of the development process and comprehensive monitoring of wildlife and habitat before during and after construction are all essential for the responsible development of offshore wind energy. The combination of alternatives should be chosen that ensures communities wildlife and the environment are protected while maximizing the creation of quality high-paying jobs and economic benefits.	
BOEM-2024-0001-0528x	The first article is “Offshore Wind Farms Are Projected to Impact Primary Production and Bottom Water Deoxygenation in the North Sea”, which is from *Communications, Earth and Environment*. Volume 3. Article number 292 by Ute Daewel, Naveed Akhtar, Nils Christiansen, and Corinna Schrum where they determine that associated wind wakes in the North Sea provoke large scale changes in annual primary production with local changes of up to plus or minus 10%. Not only at the offshore wind farm clusters, but also distributed over a wider region. The model also projects an increase in sediment, carbon, and deepen areas of the sor - of the Southern North Sea, due to reduced current velocities and decreased, dissolved oxygen inside area with already low oxygen concentration. Their results provide evidence that ongoing offshore wind farm developments can have a substantial impact on the structuring of coastal marines ecosystems on basin scales, and as one of the other previous speakers, it said, yes, there is an increase in some areas, however, the response quote the response in phytoplankton biomass is relatively small on average, but below 1%, both inside and outshore offshore wind farm cluster but can reach up to 10% locally, and that annual net, prime primary production changes in response to offshore wind wake effects in the southern North Sea areas both show areas with a decrease in areas with an increase for annual net primary production of up to 10 percent. Most obvious is the decrease in the center of the large offshore wind clusters in the inner German Bight, and at Dogger bank, which are both clearly situated in highly productive frontal areas and an increase in areas around these clusters in shallow near-coastal areas of the German Bight and at Dogger Bank. The second article is from *Frontiers in Marine Science*,	Thank you for your comment. Caution should be taken in extrapolating study outcomes from European wind farms to expected results in the NY Bight, as the environmental conditions are not equal. European wind farm facilities differ, as they are in shallower waters with weak seasonal stratification, in sheltered areas along the coasts, and arranged with tight spacing of turbines (Lentz 2017; Hogan et al. 2023). Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Presence of Structures*, which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool. Discussion of the two other references requested by the commenter—Christiansen et al. 2022 and Stoelinga et al. 2022 (ArcVera Renewables)—has been added to Appendix B.

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	February 2022. "The Emergence of Large-Scale Hydrodynamic Structures Due to Atmospheric Offshore Wind Farm Wakes" again by Christiansen and Daewel with Bughsin, Djath and Corrina Schrum. It talks about the large-scale surface heating up of up to .1 Celsius, imitating the effects of climate change in which an increase in sea surface temperature is also to be expected as a result of warming of the earth's atmosphere. Then ArcVera had recent study - ArcVera Renewables in August, 16 20, 16th 2022, which confirmed that severe under-prediction of long range wake losses by engineering wake loss models in common use and investigated long range wake loss potentials at the New York Bight offshore development sites, velocity deficits has high as Velocity deficits as high as one meter per second or 10% persist for up to persists for up to, or greater than 60 miles downwind of large or offshore arrays leading to long range energy deficits much greater than expected by most subjects experts using the weather research forecasting model, a firmly established high fidelity, numerical prediction model along with the Wind Farm parameters. Sorry, hard to sell this parameterization which was added to the model to account for the effects. We do feel the PEIS should be analyzing this ArcVera methodology as it relates the wind lease areas, cumulative wind lease areas and COPs and records of decision that have been submitted to the Atlantic Ocean to date.	
BOEM-2024-0001-0528aa	Marine food sources, such as planktons, mollusks, bivalves. The primary sources are affected by abnormal frequencies. Fish are affected by abnormal sounds and vibrations. Each species has its different vulnerability index, which is a critical component of all the overall risk assessment but it's not discussed, and that's quoted from your fine book there. The amount of marine real estate used for these turbine arrays will push natural-recurring feeding, breeding, migration, and navigation out of its natural areas.	The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. Acoustic thresholds are analyzed for multiple species. There are several AMMM measures that can be applied during pile-driving activities to address underwater noise as well. Additionally, examples of RPs for noise include MUL-5, MUL-6, and MUL-7. These include implementation of lowest noise practices for equipment, WTG installation methods, and direction to follow IMO guidelines on vessel noise, which would reduce impacts from noise on finfish, invertebrates, and EFH. A discussion regarding uncertainty about the impacts of underwater noise is included in Appendix E, *Analysis of Incomplete or Unavailable Information*. Future research will be

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		incorporated into subsequent COP NEPA analyses as information becomes available.
BOEM-2024-0001-0310a	And one of the impacts of the EMF on -- one of the questions was what are the impact of EMF on species. They directed me to a specific page in which I read and it said EMF will affect all species of sharks, skates, electric eels, and the mating of flounder. And that was just one page and there was way too much in a 1400-page document to go on.	An EMF analysis is provided in Section 3.5.5.3.3 and 3.5.5.4.1. EMF exposure levels in the built environment are not expected to reach high enough energy levels to result in impacts on populations, and there is no evidence to indicate that EMFs from undersea AC or DC power cables negatively affect commercially and recreationally important fish species (CSA Ocean Sciences Inc. and Exponent 2019; Gill and Desender 2020; NYSERDA 2017; SEER 2022; Taormina et al. 2018). Additionally, RP MUL-39 proposes the electric shielding on underwater cables to control the intensity of EMF. The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. An acknowledgment of uncertainty about the impacts of EMFs is included in Appendix E, *Analysis of Incomplete or Unavailable Information*. Future research about EMF exposure on benthic marine organisms may be incorporated into future project-specific COP NEPA analyses as information becomes available.
BOEM-2024-0001-0529cc	Offshore wind will increase climate change by increasing sea surface temperature and will decrease the upwelling and downwelling of the ocean, which decreases the productivity of all marine food webs. The loss of current, and will increase the loss of productivity, and will extend according to ArcVera's studies, up to 60 miles leeward of where the lease area is. Basically, the wind acts as a block, and as such the sea surface, where current comes from will have less wind, and will actually warm the ocean, mimicking climate change and increasing the issues of climate change. The ocean is our carbon sink. Especially in the mid-Atlantic, we have something called the Mid Atlantic Cold Pool, which Rutgers did study on in 2021, and they are extremely concerned because it has been considered basically our safety mechanism, a large pool of cold water toward the bottom. By pile driving and jet plowing the ocean floor, and then creating this lack of upwelling and downwelling, we risk losing the protective	Thank you for your comment. Section 3.4.1.4.3 and Appendix B, Section B.1.4 discuss potential impacts of WTGs on ocean temperatures. A discussion of the ArcVera study has been added in Appendix B. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of Structures*, which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool.

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	nature of the cold pool itself, which would literally put climate change on steroids.	
BOEM-2024-0001-0310o	Putting these monstrosities in Hudson Canyon, the home of hundreds of species of fish and protected marine mammals is unthinkable. This area has a unique cold pool which attracts these marine inhabitants. The currents around the turbines are exactly what breaks down the cold pool and ultimately because of the wind wake effect extending for up to 60 miles past a turbine zone, we believe it will decrease the upwelling and downwelling of the ocean and it will increase the sea surface temperature.	Avoidance of major OCS features was part of BOEM's planning process to identify lease areas (Section 1.2, Table 1-1, *History of BOEM planning and leasing activities in the NY Bight*), and none of the NY Bight lease areas are in the Hudson Canyon. Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative, Presence of Structures,* which discusses hydrodynamics, including atmospheric wakes and the Mid-Atlantic Bight Cold Pool.

P.5.10 Marine Mammals

Table P.5-10. Responses to Comments on Marine Mammals

Comment No.	Comment	Response
BOEM-2024-0001-0063-0005	Noise and Vibrations: Noise and vibrations from offshore wind turbines will have adverse effects on marine life disrupting the natural behaviors and communication patterns of marine mammals and fish.	Thank you for your comment. The potential acoustic impacts on marine mammals due to operational turbine noise is discussed in detail in Section 3.5.6.3.3, and the effects on fish are discussed in Section 3.5.5.3.3.
BOEM-2024-0001-0071-0005	83 whales wash up on our shores last year never mind the dolphins horseshoe crab and other marine life. These deaths are strongly correlated with the beginning of construction and sonar mapping for offshore wind. Why are we still moving forward with these projects?	To date, no whale mortality has been attributed to offshore wind activities. The scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the three declared UMEs for whales in 2016 and 2017 were primarily determined to be caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). These UMEs began prior to any offshore wind activities in the Atlantic Ocean. NOAA, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities. Furthermore, the Marine Mammal Commission—an independent federal agency whose purpose is the protection of marine mammals—has stated in a letter,

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		"Despite several reports in the media, there is no evidence to link these strandings to offshore wind energy development. For more information on offshore energy development and whales, please see this fact sheet produced by the Bureau of Ocean Energy Management."
BOEM-2024-0001-0176-0003	The unprecedented uptick in Whale and Dolphin deaths in the past 14 months is devastating and all of them while offshore wind vessels were surveying nearby. While you deny any connection between offshore wind and the deaths no full necropsies have been released meaning there is no evidence that there is not a connection. The Incidental Harassment Authorization is evidence! Level B Take- disrupting behavioral patterns including but no limited to migration breathing nursing breeding feeding or sheltering Level A Take- an act of annoyance pursuit torment that has the potential to injure a marine mammal or marine mammal stock in the wild. Read that again it's certain death and an invasion of THEIR ocean!	There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0180-0002	Marine mammals are being threatened harmed and even killed with the full support of both BOEM and NOAA both proponents of the "incidental take" of potentially over 1000 marine mammals many protected by the Endangered Species Act. BOEM is being completely dismissive of the fact that shellfish and finfish stocks will be significantly harmed and commercial catch is already significantly down and often no longer viable where offshore wind farms are located. Thousands of birds and bats are being destroyed worldwide with the potential result of species extinction.	"Take" of a marine mammal is a term that is specifically defined under the Marine Mammal Protection Act (MMPA) and the ESA. While the PEIS analyzes impacts on ESA-listed species, the "taking" of a marine mammal is not determined through NEPA but through the MMPA and/or ESA. For clarity, BOEM does not authorize any permits or takes. Only the NMFS has this authority through the ESA or MMPA. To date, offshore wind developers have not applied for, and NMFS has not approved, any authorization to kill any marine mammals incidental to offshore wind site characterization surveys or construction activities. Authorized takes during construction in finalized authorizations have been limited to Level A and Level B takes by acoustic harassment. Additionally, authorized takes are based on modeling and are therefore likely proportional to but not the actual number of takes that will occur during activities. Authorized takes mean that the project may not exceed the authorized number of takes

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		within the given time period of the issued permit. Consideration of takes that occur as a result of these projects is better characterized by protected species observer (PSO) reports. For example, from the published high-resolution geophysical (HRG) survey PSO reports from multiple offshore wind development projects within the U.S. Atlantic Ocean, professional PSOs recorded 2,696 large whale detections; of these, only 68 (2.5%) were detections that met Level B exposure criteria (animal distance and source operations). Consideration of other stressors that have resulted in mortality or injury of marine mammals (e.g., fisheries interactions, vessel strikes) are unrelated to the offshore wind projects considered part of the Proposed Action of this PEIS and are outside the scope of this assessment. Please see Tables P.6.13, P.6.5 and P.6.7 for responses regarding fisheries resources and bird and bat resources.
BOEM-2024-0001-0217-0001	Lack of impact studies: The total impact of these projects on endangered species and their prey has not been adequately studied. This raises concerns about potential habitat degradation and disruption of critical ecological relationships and the fact there are no studies on what the overall impacts would be were the whole 100megawatts be built out along the several hundred mile swath that is the whale migratory pathway.	Substantial scientific data exist for offshore wind development that allow for an assessment of impacts. All available information regarding long-term, regional impacts of offshore wind projects has been considered in this PEIS.
BOEM-2024-0001-0217-0003	The potential benefits for the ecosystem through whale foraging needs further research. For instance one adult humpback whale sequesters as much carbon as 70 sq miles of Forest in one year yet there's no studies to what will happen if the whales abandon these offshore areas due to the acoustic vibrations and electromagnetic fields that risk whale habitat.	Thank you for your comment. Long-term impacts of marine mammal responses to the presence of these projects are considered in Section 3.5.6.3.3, specifically the WTG Operations subsection, the Presence of Structures subsection, and the Electric and Magnetic Fields and Cable Heat subsection. Because the locations of the six proposed NYB projects do not overlap with any critical habitat or BIAs, because no barriers to migration or movement would be expected, and based on all available information, no habitat abandonment due to these offshore wind projects is expected to occur.
BOEM-2024-0001-0217-0004	Benthic environment destruction: concern that the construction of offshore energy infrastructure could damage the seafloor habitats	Benthic impacts due to construction of offshore windfarm projects were considered in this PEIS. Based on the most recent data available, effects on the seafloor habitats would be limited

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	that support Sand Lance populations a key food source for humpback whales. Positive impact of whales on the ecosystem	to short-term disturbances. Therefore, no long-term effects on marine mammal prey species or marine mammal foraging are expected.
BOEM-2024-0001-0217-0005	Improved ecology: the positive ecological impact of humpback whales in the region through their foraging activities have contributed to a thriving Sand Lance population and overall ecosystem health.	Thank you for your comment. The impact assessment of the Proposed Action (Alternative C) considered mitigation that would reduce impacts to the extent possible for whale species such that no population-level effects or long-term foraging behavior effects would be realized for humpback whales.
BOEM-2024-0001-0217-0006	Increased wildlife presence: Despite rising sea temperatures and despite current scientific understanding the author observes an increase in whales tuna and sharks in the area potentially benefiting from the improved ecosystem due to increased whale activity precisely in the areas where the wind turbines are planned and endangered the whale habitat.	The most recent PAM data, visual observation studies, and density models include these observed shifts in marine mammal distribution. Additionally, offshore wind farms are expected to have long-term benefits for climate change impacts that are driving these changes in distribution, which would subsequently benefit marine life.
BOEM-2024-0001-0217-0007	Call for further research and caution:* Data lacking: Halt further installation until research to document the positive effects of whales and quantify the potential impacts of offshore energy projects before making decisions.* Urgency and caution: Fisherman and ecologists urge the government to approach offshore energy development with caution and prioritize protecting the benthic environment crucial for whale survival. Overall there is valid concerns about the potential negative impacts of offshore energy projects on marine ecosystems and calls for a more comprehensive approach that considers the broader ecological implications before implementing these initiatives.	Thank you for your comment. BOEM used the best available science to address impacts on marine mammals in the PEIS. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding long-term, regional impacts of offshore wind projects has been considered in this PEIS.
BOEM-2024-0001-0217-0008	Additional points to consider:* The excerpt focuses on the specific case of humpback whales and Sand Lance in the western Atlantic. The impacts of offshore energy projects on other species and ecosystems may vary depending on the location and specific technologies used.* Balancing energy needs with environmental protection is a complex challenge and finding sustainable solutions requires careful consideration of all stakeholders and potential outcomes.* Ongoing research and monitoring are crucial to understanding the potential impacts of offshore energy projects and adapting strategies to minimize harm to marine life.	The discussions in the PEIS are based on the best available science to date. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding long-term, regional impacts of offshore wind projects has been considered in this PEIS.

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BOEM-2024-0001-0224-0002	I would like to draw attention to several facts that raise environmental apprehensions in relation to the proposed action: Ecological Impact: The construction and operation of wind turbines in the NY Bight will disrupt the delicate balance of marine ecosystems impacting marine life migratory patterns and overall biodiversity.	The discussions in the PEIS are based on the best available science to date. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding long-term, regional impacts of offshore wind projects has been considered in this PEIS.
BOEM-2024-0001-0255-0001	Marine mammals such as whales during these months. It might be prudent to conduct the powerful survey work during the cold months off NJ. The survey work may be what is killing the whales. Also remember that a large percent of those shipwrecks occurred during the 19th century on the shoreline.	Thank you for your comment. Seasonal restrictions are implemented for several offshore wind activities as a protection measure for certain species. There is no causal connection between offshore wind surveys and large whale mortality. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities.
BOEM-2024-0001-0284-0002	There has been a dramatic uptick in the number of deaths of whales and dolphins since the surveying started for these OSW projects. It has been more than a year since necropsies were first performed on the deceased marine life found in our ocean and on our shores. Why have we not seen any results? Why would these OSW projects be pushed along if the cause of death of these whales and dolphins have not been narrowed down?	The scientific community has determined that large whale mortality is primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). These determinations are based, in part, on published necropsy results. Please see the NMFS Marine Mammal Unusual Mortality Events page for the most recent necropsy information.
BOEM-2024-0001-0308-0002	The use of sonar for seabed mapping in the region generates noise levels up to 226 decibels at the source falling into the low-frequency range (LFI) which is within the hearing range of many whale and dolphin species. Analysis of NOAA data reveals a stronger correlation between the recent surge in whale mortalities and sonar mapping activities than with cargo ship traffic challenging the notion that increased ship traffic is the primary cause of these deaths. Statistical evidence further supports this argument. From 2020 to 2021 despite an 18.46% increase in ship traffic whale deaths astonishingly fell by 92.31%. The following year saw a 25.15% rise in ship traffic yet whale deaths still decreased by 53.85%. However a pivotal shift occurred from 2022 to 2023; ship traffic declined by 18.56% but whale deaths skyrocketed by 216.67%. This period coincides with a fourfold increase in surveying activities related to wind farm development leading to an alarming spike in whale fatalities in the New York/New Jersey area. Specifically 21 humpback whales perished which according to Gotham Whales' August 2022 count of 280 humpbacks	Most sonar used for HRG surveys is actually outside the low-frequency hearing group (see Ruppel et al. 2022). There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.

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	in the region represents a significant loss of 7.5% of the population. Moreover NOAA's estimation that only one-third of whale deaths are detected suggests the actual impact could be even more devastating. These findings starkly contradict the argument that increased ship traffic is to blame for the rise in whale deaths. Instead they implicate the intensification of surveying traffic linked to wind farm development as a significant factor. Given that a substantial 7.5% of the humpback whale population in this region was lost in a single year and considering NOAA's admission that we may only be observing a fraction of the true number of fatalities it's clear that the environmental implications of proceeding with wind turbine construction in this sensitive area are profound. This data mandates immediate comprehensive research and a cautious approach by both the Bureau of Ocean Energy Management (BOEM) and NOAA before any further development is considered.	
BOEM-2024-0001-0309-0006	Further BOEM's haste in approving the PEIS is in direct opposition to a longstanding federal protection program and in danger of disrupting a protected species that the federal government spent all this time and money to save from endangerment: the North Atlantic Right Whale protections. The North Atlantic Right Whale has been the subject of significant concern and federal protection. Since the U.S. government has spent close to $10M of taxpayer money to protect this endangered species why is this PEIS Project comprising six wind farm lease areas adjacent to the other projects already smack in the center of this federally endangered whale migration zone only nine miles from the Brigantine shore? [Footnote 19: See BOEM 2023-0030.] The cumulative effects of the vessel traffic and noise from BOEM's own PEIS is admittedly missing comparison with the mitigation effects and missing data such as NOAA takes [Footnote 20: See PEIS at D2-D2.9.1 at D-14; see also C-6 C-7.] and old outdated studies. [Footnote 21: Id. at D2-1; The Conservation November 15 2023 "As the US begins to build offshore wind farms scientists say many questions remain about impacts on the oceans and marine life." https://theconversation.com/as-the-us-begins-to-build-offshore-wind-farms-scientists-say-many-questions-remain-about-impacts-on-the-oceans-and-marine-life-216330 .] Therefore	The discussions in the PEIS are based on the best available science to date. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding long-term, regional impacts of offshore wind projects has been considered in this PEIS. Vessel strike risk is still considered as part of the No Action Alternative but is driven largely by non-offshore wind vessels, which are outside the scope of this PEIS.

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	the mitigation measures fail - yet another reason for a No Action ruling.	
BOEM-2024-0001-0313-0049	Affected Environment and Environmental Consequences 3.5.6-70 The PEIS states "Noise: Under six NY Bight projects noise generated from pile-driving will increase due to the substantial increase in the number of foundations to be installed in the NY Bight area. If project construction is staggered for all six NY Bight projects such that only one is being constructed at any given time then the total sound produced would be the same as in the one NY Bight project scenario for a given time. However if there is overlap in construction for all six NY Bight projects such that multiple projects are being constructed simultaneously within a proximal geographic area then the total sound produced could greatly increase the ensonified region within which marine mammals must forage travel and communicate. The impact of unmitigated pile-driving noise on marine mammals would remain major for the NARW as there is a reasonable likelihood that auditory injury would occur and therefore population-level impacts affecting the viability of the species cannot be ruled out. Impacts remain moderate for all other mysticetes odontocetes and pinnipeds as auditory injury could result in population-level effects for some species but the long-term viability of populations would not be affected. These impacts are expected to result from impact pile-driving whereas vibratory pile-driving would result in only minor impacts on all marine mammals including NARWs." Comment Concerns exist about the cumulative impacts of noise and the synergistic and potential cacophonous auditory impacts from multiple ongoing activities. Similar to comment expressed about air quality impacts there is a potential for a concentrated and greater adverse impact to sound and impacts to organisms in the waterbody to humans and our quality of life. The analytical structure of the PEIS to examine the impact of one representative NY Bight Project does not account for the logarithmic nature of noise impacts for all 6 lease projects nor the quantified evaluation of a likely scenario where this activity could be happening all at once and have a greater deleterious impact	Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding long-term, regional impacts of offshore wind projects has been considered in this PEIS. Project and site-specific noise exposure modeling will be conducted during the COP-level NEPA stage for individual projects. The assessment in this PEIS is intentionally qualitative because local environmental and project-specific conditions will affect noise production. Cumulative effects from multiple projects were considered in Section 3.5.6.3.3, and this information was carried forward in Section 3.5.6.5 during the assessment of Alternative C. Furthermore, the Proposed Action in this PEIS (Alternative C) analyzes the use of mitigation measures, which would not allow unmitigated pile driving.

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BOEM-2024-0001-0326-0001	There has not been enough study on the impacts on the marine life that the windmills will cause. We are already seeing a large increase in mammal fatalities. Directly coinciding with sonar mapping of the ocean floor.	Offshore wind turbines have been in operation and have been the topic of many biological studies in Europe since the 1990s, and approximately 116 offshore wind farms operate in 12 European countries (more outside of Europe). Therefore, while this may be a newer industry in the United States, it is not one that is unstudied or that has unknown impacts. In regard to the marine mammal mortalities, there is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0328-0001	Please stop the development of wind farms- there needs to be unbiased studies of the whale's navigating system within their inner ear and the effects of sonar exploration and pile driving.	Thank you for your comment. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding potential impacts from offshore wind projects on marine mammals has been considered in this PEIS.
BOEM-2024-0001-0331-0004	the failure to coordinate and disclose results of other key environmental reviews e.g. the rulemaking proceeding under the Marine Mammal Protection Act and the overall level of obfuscation is unprecedented.	The results of all other environmental reviews of offshore wind projects conducted by BOEM (available to date) are published on its website, and all MMPA consultations conducted by NMFS for offshore wind projects available to date are available on its website. Additionally, NMFS is a cooperating agency for this PEIS and has reviewed/provided comments pertaining to its roles enforcing the MMPA and ESA. No specific NMFS ESA or MMPA consultations have been performed for this PEIS, given the programmatic nature of this evaluation, but coordination is ongoing with NMFS on a Programmatic Framework BA. Future

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		project-specific consultations will be conducted, and the results of those assessments will be similarly published as they are finalized.
BOEM-2024-0001-0331-0008	According to Scientists who participated in the National Academies of Sciences Engineering and Medicine examination of how constructing offshore wind farms in the Nantucket Shoals region southeast of Massachusetts could affect critically endangered North Atlantic right whales the concluded that there are knowledge gaps in understanding the impact of offshore wind.	Thank you for your comment. The NASEM (2023) report has been reviewed and incorporated into the PEIS to consider potential effects of offshore wind farms in this region.
BOEM-2024-0001-0331-0010	There are also a lot of knowledge gaps on the biology side including questions about what species of zooplankton are in the Nantucket Shoals region where they come from and what makes them aggregate into patches that are dense enough for right whales to eat. Right whale feeding in the Nantucket Shoals region isn't well understood so scientists need observations to determine which zooplankton types are targeted by right whales and where and when the whales feed." The PEIS is another example of BOEM's lack of relevant and rigorous scientific studies to use for the huge scope of these projects. The BOEM reports lack baseline data overall from offshore wind development from this region. There is a growing interest and evidence of how ocean sediments and marine mammals are useful to sequester carbon. However this has not been studied or assessed thoroughly yet and this proposed massive industrialization will cause more harm. The issue of Electromagnetic fields effects has not been scaled. There is a lack of rigorous and relevant research on pile driving impacts on marine mammals specifically baleen whales and the response of large whale species to extensive networks of wind turbines.	Thank you for your comment. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding potential impacts from offshore wind projects on marine mammals has been considered in this PEIS. The NASEM (2023) report information has been incorporated into the PEIS.
BOEM-2024-0001-0331-0019	The disturbance of marine life during the surveying construction and operation of the NY/NJ projects will be significant. The number of Level B Harassment Takes on the Atlantic Coast during the 2024-25 time period alone totals 249503 and the number of Level A Injury Takes during the 2024-25 time period totals 761. The total number of Level B takes of endangered species totals 920 and Level A Injury endangered species Takes total 9. This includes IHA Permits for 26 offshore projects from Massachusetts to South Carolina. The total	Authorized takes are based on modeling and are therefore likely proportional to but not the actual number of takes that *will* occur during activities. Authorized takes mean that the project may not exceed the number of takes authorized within the given time period of the issued permit. For example, from the published HRG survey PSO reports from multiple offshore wind development projects within the U.S. Atlantic Ocean, professional PSOs recorded 2,696 large whale detections; of these, only 68

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	number of Level B Harassment Takes for Atlantic Shores project permits alone will total 10998 during the time period including 35 takes for endangered species. (See Appendix A). The authorization of this cumulative level of takes is irresponsible and reckless.	(2.5%) were detections that met Level B exposure criteria (animal distance and source operations).
BOEM-2024-0001-0331-0023	PEIS Lacks Sufficient Information and Mitigation for Noise Impacts Noise impacts from pre-construction construction operations and maintenance and decommissioning will impact marine mammals and other marine life for entire life cycle of the projects in the 6 lease areas. Potential and unknown impacts include noise electromagnetic fields navigational safety changes to benthic and pelagic habitats behavioral changes in wildlife alternations to food webs invasive species concerns and pollution from increased vessel traffic heat and onshore and offshore infrastructure. We are attaching a Report and Congressional Testimony from Dr. Bob Stern of Save LBI as part of our comments to add to our public comment record (see Appendix B). Unless BOEM addresses the issues outlined in his report EIS will be inaccurate and misleading. There is a lack of basic research of the impacts of OSW energy development on large whale species in U.S. waters particularly in the mid-Atlantic region. It is reckless to move forward without the scientific baseline assessments for what harm may or could occur to whales before issuing any permits and authorizations including IHAs ITRs and associated LOAs including the failure to include crucial scientific assessments and consultations as follows:	Thank you for your comment. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding potential impacts from offshore wind projects on marine mammals has been considered in this PEIS. Additionally, given the programmatic nature of this assessment, BOEM expects project-specific analyses of noise and other effects will be conducted during future project NEPA stages, which will further address specific, quantitative effects from offshore wind development of these projects.
BOEM-2024-0001-0331-0024	In a May 2022 letter obtained under the Freedom of Information Act by Bloomberg Law Dr. Sean Hayes PhD Chief of Protected Species NOAA NEFSC clearly documents and confirms the NARW's fragile hold on existence. First the Chief of Protected Species notes that there are less than 350 remaining NARW animals. (Letter from Sean A. Hayes PhD Chief of Protected Species NOAA NEFSC to Brian R. Hooker Lead Biologist Bureau of Ocean Energy Management Office of Renewable Energy Programs dated May 13 2022.) Again we note the Draft North Atlantic Right Whale and Offshore Wind Strategy states that not one animal can be lost. In regard to the development phases of offshore wind Dr. Hayes states in his letter: "The development of offshore wind poses risks to these species which is	Thank you for your comment. The information contained in the Hayes (2022) letter has been included in this PEIS, and all consideration of effects is based on the best available science to date. Effects on the NARW population being driven by non-offshore wind-related activities (e.g., non-offshore wind vessel traffic, fisheries interactions) are outside the scope of this PEIS. These stressors are discussed in the PEIS as baseline information for comparison to the Proposed Action.

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	magnified in southern New England waters due to species abundance and distribution. These risks occur at varying stages including construction and development and include increased noise vessel traffic habitat modifications water withdrawals associated with certain sub-stations and resultant impingement/entrainment of zooplankton changes in fishing effort and related potential increased entanglement risk and oceanographic changes that may disrupt the distribution abundance and availability of typical right whale food (e.g. Dorrell et al 2022)." It is clear that any further disturbance of the NARW species will have an impact on this critically endangered species. Some scientists estimate that the species will go extinct within 20 years with current threats. (Pennisi Elizabeth. "The North Atlantic right whole faces extinction." Science November 7 2017 https://www.science.org/content/article/north-atlantic-right-whale-faces- extinction.	
BOEM-2024-0001-0331-0026	According to statistical analysis and independent research by Apostolos Gerasoulis Professor of Computer Science at Rutgers University the construction of wind turbines in the New York Bight poses a significant threat to the marine ecosystem particularly affecting numerous whale and fish species that frequent this area as reported by Gotham Whales. This includes several endangered species highlighting the critical nature of the threat. The use of sonar for seabed mapping in the region generates noise levels up to 226 decibels at the source falling into the low- frequency range (LFI) which is within the hearing range of many whale and dolphin species. Analysis of NOAA data reveals a stronger correlation between the recent surge in whale mortalities and sonar mapping activities than with cargo ship traffic challenging the notion that increased ship traffic is the primary cause of these deaths. According to Gerasoulis statistical evidence further supports this argument. From 2020 to 2021 despite an 18.46% increase in ship traffic whale deaths astonishingly fell by 92.31%. The following year saw a 25.15% rise in ship traffic yet whale deaths still decreased by 53.85%. However a pivotal shift occurred from 2022 to 2023; ship traffic declined by 18.56% but whale deaths skyrocketed by 216.67%. This period coincides with a fourfold increase in surveying activities	Most sonar used for HRG surveys is actually outside the low-frequency hearing group range (see Ruppel et al. 2022). There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). The NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.

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	related to wind farm development leading to an alarming spike in whale fatalities in the New York/New Jersey area. Specifically 21 humpback whales perished which according to Gotham Whales' August 2022 count of 280 humpbacks in the region represents a significant loss of 7.5% of the population. Moreover NOAA's estimation that only one-third of whale deaths are detected suggests the actual impact could be even more devastating.	
BOEM-2024-0001-0331-0027	We agree with Dr. Gerasoulis' belief that these findings starkly contradict the argument that increased ship traffic is to blame for the rise in whale deaths. Instead they implicate the intensification of surveying traffic linked to wind farm development as a significant factor. Given that a substantial 7.5% of the humpback whale population in this region was lost in a single year and considering NOAA's admission that we may only be observing a fraction of the true number of fatalities it's clear that the environmental implications of proceeding with wind turbine construction in this sensitive area are profound. This data mandates immediate comprehensive research and a cautious approach by both the Bureau of Ocean Energy Management (BOEM) and NOAA before any further development is considered. SEE ORIGINAL COMMENT FOR GRAPH: Humpback Whale Deaths per Year in Polygon includes NYNJRI new	The scientific community has determined that large whale mortality is primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales).
BOEM-2024-0001-0331-0045	I would like to focus on just one topic noise to whales and to we humans from these wind energy activities. The whales rely on noise for everything including communication. navigation sensing danger and finding food. If loud enough a noise can directly damage the whale's hearing at lower levels it disturbs their behavior. Disturbance may not sound so bad but it too can lead indirectly to serious harm and fatality for example through separation of a mother and calf because their communications are overridden or by a whale surfacing to lessen the noise while losing its ability to detect and avoid oncoming ships. Since December there have been nine whale strandings on the New Jersey coast. This is very unusual given that the annual average is seven. Of the nine four have been identified as possibly due to vessel strike and noise may be a contributing factor there with the remaining causes so far unresolved. The only recent	There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.

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	difference offshore that we are aware of are the multiple wind energy vessels using high intensity noise devices to characterize the seabed. We commented a year ago to the National Marine Fisheries Service that the noise source number they were using for the strongest device was too low and the noise dissipation assumed too high and therefore the affected distance was significantly underestimated. With proper assumptions as shown in Table 1 the elevated noise from that device extends quite far and could affect a significant number of animals. Given the vessel presence and the noise levels there is ample reason to suspect that the surveys are a plausible cause of the recent deaths. At a minimum a thorough objective transparent investigation is warranted- that is not asking for much. Unfortunately the vessel surveys are just the beginning of the noise problems the whales will face. The noise from pile driving 49-foot diameter steel foundations into the seabed will be intense and require many strikes over a period of several years. Here again we find an underestimation of impacts as shown in Table 2. In our view the worst noise problem of all will come from the operation of the much larger turbines proposed today. We hired a respected acoustics engineering company to assess the noise levels generated from the full wind project proposed off LBI. Based on their results in Figure 1 the noise levels that baleen whales would avoid extend at least 93 miles from shore. With the critically endangered North Atlantic right whale migrating historically within 86 miles this project could potentially block its migration and seal its fate. This operational noise problem is not being addressed by the agencies and that is one reason why we sent a detailed letter to President Biden asking for his personal intervention (Attachment).	
BOEM-2024-0001-0331-0047	So where do we go from here? We recommend creation of a Science Board within NOAA with sufficient authority to initially conduct a thorough vessel survey investigation and then to establish protocols for government-wide use in predicting marine animal impact from noise. Beyond that this program cries out for some common-sense turbine siting criteria e.g. a turbine exclusion zone from shore and excluding turbines from primary whale migration corridors.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program.

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BOEM-2024-0001-0334-0004	We cannot simply accept at face value that you are operating truthfully about the effects of sonar on marine mammals. The increase in ocean mammal deaths is now commonly understood to result from the aftermath of exposure to sonar and other sonic surveying. Expect that the assertion that "there is no evidence that sonar is killing the whales and dolphins" (much like the tobacco industry's "there's no evidence that cigarette smoking causes cancer") will have to pivot to proving to the public that the dead mammals found have no issues in their navigational tissues. Further evidence is emerging every week with more compelling correlations between whale deaths and recent sonar boat activity. If the evidence mounts sufficiently to sway a (fair) court of law you might expect to be instructed to rescind your take authorizations and the ability to grant any further ones will end. It is not lost on me and many others that take authorizations are legal for U.S. companies only yet foreign companies are using a thin veil of U.S. shell companies to skirt this and that is. SEE ORIGINAL COMMENT FOR GRAPH: Whale Deaths/Offshore Wind Survey Vessels NJ/NY	There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0345-0015	Whale Death Analysis There has been a great deal of misconception around the impact offshore wind will have on whales and other marine mammals. This myth was raised frequently during the public comment period for this PEIS. CCE thanks BOEM as well as NOAA for their proactive approach in putting out public factsheets and up-to-date information explaining that the increase in whale strandings and fatalities is not linked to offshore wind activity. However the misconception still remains that wind surveys are responsible for whale mortality events and that the "authorized takes" allowed by offshore wind companies could be killing whales. It would be helpful for the final PEIS and for the individual projects' DEIS moving forward to better clarify the difference between a "Level A" and "Level B" take and what direct impacts including nuisance impacts are actually being authorized to occur during construction and operation of these turbines. [Underline: CCE also recommends BOEM include more detailed information on not only the ongoing rigorous studies and data being collected to minimize impacts to whales to the greatest extent	Thank you for your comment. BOEM agrees with all points made about the misconceptions regarding offshore wind activities and the whale strandings and appreciates your feedback. Regarding the comment about including this as a discussion in future NEPA documents, BOEM will take this into consideration as it administers its program. Due to the programmatic nature of this assessment, MMPA consultation will not be conducted. However, MMPA consultations are expected for the individual projects included in this PEIS, and BOEM will consider including clarification of Level A and Level B impacts in future NEPA documents. Individual project MMPA authorizations will have PSO reports on the NMFS MMPA authorization website for each project.

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	possible and but also to include data on what is actually causing the unusual mortality events. In the absence of facts myths spread.] It is important to note that the increase in whale mortality events started in 2016 far before any offshore wind development was occurring off our shores. That in fact there is no evidence that offshore wind is a contributing factor to any of these strandings or deaths. Necropsies have been performed on approximately half of the 181 whales that died through February 2023. The results showed that 40% had evidence of either entanglement in fishing gear or a ship strike. This is consistent with studies across the country and the globe which identify ship strikes and fishing gear as the greatest human threats to these species. Since the Covid pandemic there is a 35% increase in the volume of shipping to NY and NJ ports since 2019. Furthermore approximately 40% of these cargo ships are carrying oil an impact that could be offset by reliance on local renewable energy like offshore wind. In addition marine mammal scientists have identified that not only do we have more whales in the New York Bight but they are staying in this region longer due to increased food supply. As offshore wind projects move forward offshore wind companies are conducting regular survey work. Each offshore wind vessel is mandated to have an independent protected species observer (PSO) onboard who collects valuable data about marine mammal activity in the survey area. The information from offshore wind surveys and PSOs should be collected by BOEM and made publicly available on a regular basis to aid other vessels and commercial fishing operations in avoiding areas with whale sightings. [Underline: The positive impacts of reducing our reliance on oil cargo ships and the potential benefits of the in-depth whale monitoring data collected by the offshore wind companies should be considered by BOEM in the PEIS.] Thank you for your consideration of our comments.	
BOEM-2024-0001-0350-0001	The greatest concern is that the combined excessive noise created by these six projects will severely harm whales and other protected species. This is especially true for the incredibly loud clangor made from driving the monstrous monopiles that hold up the enormous wind turbines into the waterbody's floor. Construction of all six	The discussions in the PEIS are based on the best available science to date. The PEIS serves as a relevant review of the existing knowledge for future wind development projects and scientific researchers to consider. Additionally, project and site-specific noise exposure modeling will be conducted during the COP-level NEPA stage for these projects. The assessment in this

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	projects may occur simultaneously further exacerbating the cacophony.	PEIS is intentionally qualitative because local environmental and project-specific conditions will affect noise production. Cumulative effects from multiple projects were considered in Section 3.5.6.3.3, and this information was carried forward in Section 3.5.6.5 during the assessment of Alternative C.
BOEM-2024-0001-0350-0003	On this matter the PEIS is absolutely absurd. It is structured like a project environmental impact statement (EIS) so the pile-driving impacts are supposedly addressed in a technical appendix on "acoustics;" in this case it is "Appendix J: Introduction to Sound and Acoustic Assessment." The operative word in the appendix title is "Introduction" as it is basically an academic treatise. In fact it starts off by explaining at length how underwater sound is measured. We do finally get to the Bight but that is about as far as the discussion goes. What we find instead is a regurgitation of an academic paper that bears no resemblance to the six projects this assessment is supposed to be addressing To begin with the draft uses just two theoretical sites with a mere 60 turbines each for a total of 120 turbines. BOEM says these six real sites are expected to develop up to 7000 MW of generating capacity and recent site designs use 13 MW turbines which would require approximately 540 turbines or almost five times as many as discussed in the draft. Furthermore the PEIS study uses noise levels from small 6 MW turbines. At that size we are discussing a sum closer to 1200 turbines or roughly ten times as many as are considered. The potential impact of 120 turbines is clearly not helpful in assessing 1200. To make matters worse the pile driving noise level referenced in the study is for driving a roughly 20-foot diameter pile which is very small by present and future standards. Today's 13 to 15 MW turbines use piles closer to 40 feet in diameter. Moreover gigantic 20 MW turbines have just been introduced which might take 60-foot diameter piles. The noise level is based on the energy of the pile-driving hammer and bigger piles require a greater amount of energy to drive so there is a significantly greater amount of noise realistically that what is accounted for in the draft.. One wonders why BOEM did not measure the noise from the much bigger piles that were being driven back in July just off Rhode Island? The answer seems to be that BOEM did not want to put any	The discussions in the PEIS are based on the best available science to date. The PEIS serves as a relevant review of the existing knowledge for future wind development projects and scientific researchers to consider. The PEIS does not assess impacts from individual projects, which will be analyzed in their own COP-level NEPA analysis and tier off this analysis. Additionally, project and site-specific noise exposure modeling will be conducted during the COP-level NEPA stage for these projects. The assessment in this PEIS is intentionally qualitative because local environmental and project-specific conditions will affect noise production. Cumulative effects from multiple projects were considered in Section 3.5.6.3.3, and this information was carried forward in Section 3.5.6.5 during the assessment of Alternative C. Additionally, the two offshore wind projects that were recently installed or are being installed offshore Rhode Island and Massachusetts did include acoustic measurements of pile driving noise. However, given the timing of these activities, the reports are not yet available for incorporation into this PEIS. BOEM will incorporate this information into future reports when available.

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	serious work into this PEIS. In short the academic acoustic case considered in the PEIS tells us absolutely nothing about the potentially immense noise impact of the six projects supposedly being assessed. There is quite literally no environmental impact assessment here. This vacuum seems to hold for virtually the entire PEIS with no real assessment of the six projects. There is certainly nothing of substance on noise. As environmental impact statements go this one is essentially useless.	
BOEM-2024-0001-0354-0015	POINT VI The approval of the within NY Bight Industrial Wind Turbine Project without independent peer reviewed scientific research on the negative impacts upon marine mammals and in particular the North American Right Whale is violative of the Endangered Species Act and NEPA.	Thank you for your comment. The discussions in the PEIS are based on the best available science to date.
BOEM-2024-0001-0354-0016	An even more appalling aspect of the within proposal can be seen in the lack of scientific method and any good faith attempt at a complex economic evaluation to be applied to the critically threatened North American Right Whales. This species is in dire jeopardy due to this specific proposal and the threat of pollution generating windfarms proposed to be constructed directly in the right Whales' primary and sole migratory waterways off the New Jersey Coast. With approximately three hundred fifty (350) North Atlantic Right Whales left in the entire world the DEiS barely touches the surface as to the potentially devastating if not terminating impact of this vast industrial project itself and numerous ongoing adverse impacts presented. From a noise perspective pollution generating standpoint and otherwise the construction operation and totally ignored dismantling and decommissioning process of the gigantic wind turbines themselves has insufficiently been addressed. Moreover the Draft Environmental Statement does not recognize the legal and moral standing of such an invaluable threatened species whose inspirational value beauty and potential worth as to biodiversity for our planet and to life itself cannot be overstated. How outrageous is it that this entire species of the North Atlantic Right Whales in all likelihood is being condemned to extinction by this juggernaut of industrial windfarm construction in this treasured creature's only habitat and migratory living pathways. What	Thank you for your comment. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding potential impacts from offshore wind projects on marine mammals has been considered in this PEIS. However, an economic evaluation of NARW is outside the scope of this PEIS.

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	arrogance and true ignorance of science has been presented!. What is the value of this species now being wiped off the face of the earth?	
BOEM-2024-0001-0355-0001	With the proposed OSW projects I see a whole list of negatives and no positives at all. The list of negatives include: Marine/Mammal Deaths the evidence exists that there IS a correlation with survey vessels driving pilings with whale deaths and other mammals and disruption of the ecosystem. The marine life and ecosystem in our oceans will undergo significant transformations potentially leading to the extinction of some marine mammals. (BOEM reference material on Marine Life)	There is no evidence of death or serious injury from offshore wind preconstruction surveys or from offshore wind pile driving or offshore wind vessel strike. The greatest transformational threat to the marine ecosystem is climate change. There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0355-0023	With the proposed OSW projects I see a whole list of negatives and no positives at all. The list of negatives include: - Marine/Mammal Deaths the evidence exists that there IS a correlation with survey vessels driving pilings with whale deaths and other mammals and disruption of the ecosystem. The marine life and ecosystem in our oceans will undergo significant transformations potentially leading to the extinction of some marine mammals. (BOEM reference material on Marine Life)	Duplicate comment. Refer to response to comment BOEM-2024-0001-0355-0001.
BOEM-2024-0001-0355-0051	From the BOEMRE-2011-09 report: "Many fundamental questions about sensory system mechanisms and life functions supported by these senses [Bold Underline: have not been resolved.] Just a small fraction of marine species have been directly studied for magnetic or electric senses." I also want to call your attention to the attached article. This is just one of many of the RISKS of these HIGH VOLTAGE underground cables. Again [Bold: more time and studies are needed before you can approve these permits]. There are SO MANY	The discussions in the PEIS are based on the best available science to date. Available data suggest marine mammals are minimally magneto-sensitive and, as discussed in the PEIS, impacts would be limited to effects on prey. However, the inherent cable protections built into subsea cables are expected to mitigate EMFs produced, and additional mitigation measures considered under Alternative C would further reduce the risk of

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	UNANSWERED questions actually more questions than answers. This must not be approved until more information is available and the DEP can make an informed confident decision. For your reference this is one of many instances where BOEM supplies no evidence despite the data that is there and make empty non-validated claims. There is clear data to support the opposite of what they say. See Evidence Video.	effects from the expected development in the NY Bight lease areas.
BOEM-2024-0001-0356-0002	The first of which is the outdated permissible decibel level used by NOAA for Incidental Takes. Recent Congressional testimony by Rand Accoustics showed that the geotechnical survey levels are actually in certain cases 16 decibels louder than what is permitted. With this updated independent information the NOAA proxy numbers used in this EIS are incorrect and need to be re-addressed at the very least. Researchers have repeatedly brought this information before BOEM and NOAA many times and both BOEM and NOAA refuse to acknowledge that the original decibel levels are far from correct. See the attached document referenced from Rand Accoustics.	The methods used to estimate acoustic ranges and the regulatory thresholds used to assess effects are considered the best available science and are used consistently and correctly in the permitting literature.
BOEM-2024-0001-0357-0001	The six New York Bight areas are shown in Exhibit 1 along with the nearby New Jersey wind energy area. Wind energy development off the New Jersey coast is unique with regard to all other US projects because it proposes development both close to shore and father from shore in fact impacting the entire 50-mile-wide historic migration corridor of the critically endangered North Atlantic right whale.	Thank you for your comments. The discussions in the PEIS are based on the best available science to date regarding existing environmental conditions and marine mammal distribution, such that effects from projects in this region are sufficiently covered in the PEIS.
BOEM-2024-0001-0357-0005	Need to Consider Full Real Area Impact for Project Decisions in the NJ/NY Area. Off the New Jersey coast the BOEM uniquely proposes energy projects both close to shore and farther out. As presented below there are many environmental impacts from those projects that have significant cumulative effects on the offshore New Jersey and New York Bight areas. Neither this draft program EIS or any project specific EIS provides a cumulative impact analysis of turbine operation from all these projects on the whale. Such an assessment of the impact of concurrent turbine operation from all projects on the migration of the North Atlantic right whale (NARW) is provided here in Enclosure II. It can be seen that concurrent turbine operation of the projects in the New Jersey area and the New York Bight areas	Thank you for your comments. The discussions in the PEIS are based on the best available science to date regarding existing environmental conditions and marine mammal distribution, such that effects from projects in this region are sufficiently covered in the PEIS.

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	leaves no viable path for the North Atlantic right whale to migrate. Therefore with respect to AMMM measures this program EIS or a project-specific EIS should include alternatives among projects and options within projects such as lesser turbine powers greater spacing the use of direct drive versus gearbox turbines turbine exclusions zones in the lease areas away from the whale's migratory paths and other initiatives to allow for migration of the whale (see Enclosure I).	
BOEM-2024-0001-0357-0010	Neither this draft program EIS or any project specific EIS presents a cumulative assessment of the marine mammal takes from concurrent project vessel surveys using high intensity noise devices to characterize the seabed. Such vessel surveys have been implicated in spikes of recent whale deaths along the New Jersey and New York coasts. But no AMMM measures are provided to address this problem such as reducing vessel survey areas and establishing a cooperative data sharing program to minimize the number of vessels needed and this sounds like you're not seeing. (see Enclosure VII).	Cumulative impacts for marine mammals of the proposed alternatives are assessed in Sections 3.5.6.5.2 and 3.5.6.5.4 of the PEIS. AMMM measures in the PEIS may be applied to all projects within the six NY Bight lease areas. However, these measures do not reflect additional measures that could be required for each individual project, or potential measures developed for future data sharing opportunities.
BOEM-2024-0001-0357-0015	To the NARW: Once BOEM does that it would find for example with the respect to the cumulative impacts of [Bold: operational] turbine noise on the migration of the North Atlantic right whale as presented in Enclosure II that one critical avoidance measure is to choose between close in and farther out projects. Wind projects in both the close-in Atlantic Shores lease area and the farther out NY Bight areas leave no path for the right whale to migrate past New Jersey dooming it. The BOEM must chose one it cannot have both. Once it reaches that inescapable conclusion the choice should among projects should be obvious.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur at the project-specific COP-level NEPA analysis level. However, the discussions in the PEIS are based on the best available science to date. The potential acoustic impacts on marine mammals from operational turbine noise and potential behavioral disturbances from the presence of structures are discussed in detail in Section 3.5.6.3.3. Results of this assessment concluded that migratory pathways may be altered but would not be fully blocked for any marine mammal species.
BOEM-2024-0001-0357-0016	With the close-in Atlantic Shores project we have the blocking off an historic primary 12-mile- wide migration corridor of the right whale adjacent to that project area. Farther out we would still have obstruction of the whales migration from those areas as well.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis.
BOEM-2024-0001-0357-0021	So if an offshore wind energy program proceeds that choice to protect the right whale should be obvious. The Atlantic Shores project must be terminated to preserve the New Jersey shore experience and leave a path for the right whale to migrate.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This comment is addressing Atlantic Shores not the NY Bight. The NY Bight PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis.

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BOEM-2024-0001-0357-0034	Within the above framework the following AMMM measures should be considered in the EIS: With the respect to the cumulative impacts of construction [Bold: and operational] noise on the migration of the North Atlantic right whale discussed in Enclosure II: 1.One critical avoidance measure Is to choose between close in and farther out projects. Wind projects in both the close-in Atlantic Shores lease area and the farther out NY Bight areas leave no path for the right whale to migrate past New Jersey the federal agency must chose one it cannot have both. Once it reaches that inescapable conclusion the choice should be obvious.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis.
BOEM-2024-0001-0357-0036	With the close-in Atlantic Shores project we have the blocking off an historic primary 12-mile- wide migration corridor of the right whale adjacent to that project area. Farther out we would still have obstruction of the whales migration from those areas as well.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis.
BOEM-2024-0001-0357-0049	Effect on Whales & other Marine Mammals. Compunding this problem the synergistic impact of the vessel traffic change and the operational noise impact from the larger turbines will have a significant impact on the migration of the North Atlantic right whale and other marine mammals. As discussed in Enclosure the strip between the Atlantic Shores lease area and the Hudson South area has been a primary migration corridor for the North Atlantic right whale. That same strip has been proposed by the U. S Coast Guard as a deep. deep draft vessel corridor. Also as shown in Enclosure II the noise levels in that corridor from turbine operation will be above that that will disrupt the whale's migration and disturb and disorient any whale attempting to migrate through it. Worsening the situation further are experimental results showing that one reaction of the right whale to such noise is to surface to lessen the noise which would make it more susceptible to strike from those deep draft and other vessels in the corridor. Therefore the synergistic effect of the concentrated vessel traffic and whale migration in the same narrow corridor the disorienting effect on the whale from turbine operational noise and the tendency of whales to surface to avoid that noise could have a devastating effect on marine mammals off the coast of New Jersey. The BOEM the Coast Guard	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis. However, the discussions in the PEIS are based on the best available science to date. The potential acoustic impacts on marine mammals from operational turbine noise and potential behavioral disturbances from the presence of structures are discussed in detail in Section 3.5.6.3.3. Results of this assessment concluded that migratory pathways may be altered but would not be blocked for any marine mammal species.

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	and NOAA should immediately convene to assess that synergistic affect and at a minimum provide analysis of it in this NY Bight EIS.	
BOEM-2024-0001-0357-0058	The cumulative impact of the vessel surveys it's not just a matter of adding the take estimates from each survey. It needs to correct the NMFS practice of using unsupported low noise source levels from a surrogate device rather than higher levels from measurements of the devices being used. It needs to correct the NMFS practice of using the 20 dB loss factor for spherical spreading beyond the range where such optimistic spreading occurs. The combined impact of those significantly reduces the actual distance where noise above 160 dB exists from one and a half miles using proper assumptions to 0.1 miles using the erroneous ones. With proper source levels and transmission losses it can be shown that there are numerous scenarios for example a survey vessel traveling parallel to and overtaking a whale where the threshold for permanent hearing loss will be exceeded and many other cases where the threshold for temporary hearing threshold loss will be exceeded. The cumulative impact analysis should address those scenarios and visibly show its modeling assumptions not relegate them to an opaque computer model on it was survey table to learn from group that time by a number of another name are: well these days or more users will block or use a know where the need for new hires or am	Based on the scientific literature (e.g., Ruppel et al. 2022) the 20 log (i.e. not 20 dB) transmission loss coefficient is the correct spreading loss to use for calculations. Several in situ field measurements support this transmission loss coefficient for HRG surveys.
BOEM-2024-0001-0357-0063	The agencies provide no specific noise source attenuation system that would achieve this reduction. Nor do they provide technical justification for the assumed 10 dB attenuation upon which they relies heavily for certain calculations and conclusions. Without that specific proposal and justification the assumption appears to be arbitrary and designed to artificially keep the level A take number from direct injury according to the current calculations below the biological removal rate for the right whale. Regarding source attenuation it should be noted first that the use of bubble curtains or other systems that are placed immediately around the pile are inherently limited because they cannot attenuate ground-borne re-radiated sound. Therefore appreciable attenuation is not achieved for the sound that resonates through the ground into the far field. More of the sound emitted during impact pile driving resonates from	Thank you for the comment. Noise attenuation technology continues to evolve, and there are many options available today, either a single solution or a combination of solutions, that can reach 10 dB or more of noise attenuation from the unmitigated case (Bellmann et al. 2020). Examples of the growing number of noise attenuation solutions include the IHC-Noise Mitigation Screen, OffNoise Solutions GmbH's Hydro-Sound Damper, the big bubble curtain or double bubble curtains (available from several suppliers), and the Grout Annulus Bubble Curtain. In addition, there are alternative hammer designs (e.g., IQIP-Pulse and Menck Noise Reduction Unit) that can be used to reduce the noise associated with impact pile driving over traditional methods. As the commenter points out, near-field resonate systems can be tuned to target the

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	the ground than through the water column (Caltrans. 2015. Technical guidance for assessment and mitigation of the hydro acoustic effects of pile driving on fish State of California Department of Transportation Sacramento California) and such sound is also of lower frequency impacting LFC's such as the right whale. In the NMFS proposed rule under the MMPA the Level A take number for the right whale shown in Table 24 of less than one is critically dependent on the January through April exclusion timeframe (should also include December) and the assumed 10 dB attenuation of the pile driving noise source. However regarding the assumed attenuation at the source there is only a general reference to the use of bubble curtains in Section 11.2.12 with no specifics as to how it will be achieved in practice. That section also refers to prior measurements of noise attenuation systems that are reasonably expected to achieve greater than a 10 dB broadband attenuation. However there is no reference provided for those measurements and that assurance and it is unlikely that any prior measurements would be relevant to these new large diameter monopiles and jacket foundations. The discussion of sound attenuation methods in the rule's Appendix B Section 2.4 also does not inspire confidence regarding achieving a 10 dB attenuation. It does mention the difficulties encountered with needing larger bubbles for lower frequencies as discussed further below. According to the references provided the single bubble systems appear limited to piles less than 8 meters in diameter even though these piles could be as large as 15 meters. The Bellman reference states that noise attenuation systems for jacket foundations are limited yet the Tables in the project's MMPA Application include 10 dB and higher attenuations for construction schedule 2 involving jacket foundations. The references indicate that for monopile foundations double bubble curtains or other auxiliary systems will be necessary but it's not clear that those will be successful for these diameters. In short much of the discussion is not relevant to the large diameter monopile foundations here or the jacket foundations. There is no specific proposal made that would be expected to achieve a 10 dB attenuation in the context of this project.	reduction of sound at specific frequencies. This is an active field of research, and the technology is continually evolving. The commenter is referred to the Bellmann et al. 2020 technical report entitled, “Underwater noise during percussive pile driving: influencing factors on pile-driving noise and technical possibilities to comply with noise mitigation values” for details on the proven effectiveness of these systems alone or in combination with other systems.

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BOEM-2024-0001-0357-0064	Absent evidence to the contrary assumptions regarding broadband noise attenuation from air bubble curtains should be less than 5 dB as recommended in Buehler 2015 titled Technical Guidance for Assessment and Mitigation of the Hydro acoustic effects of Pile Driving on Fish (see page 410). On page 218 Buehler (2015) cites actual project results of 0 to 5 dB of attenuation. Measured noise levels in the report titled Underwater Sound Levels associated with Driving Steel Piles at the Vashon Ferry Terminal Laughlin April 2010 show in Table 2 the effect of bubbles on root mean square (rms) noise values to be 1 dB. The report titled Underwater Reduction of Marine Pile Driving using a Double Pile Reinhall December 2015 shows a maximum 5.5 dB reduction in rms levels for a bubble curtain. The Caltrans 2015 study cited above has also stated that even in the near field an assumed source level reduction should be limited to 5 dB because of the uncertainties associated with the degree of attenuation that would be provided by a bubble curtain. Thus achieving a 10 dB reduction would require an auxiliary system such as a double wall pile. However as discussed below even that would not address the problem of achieving reductions at the lower frequencies relevant to the right whale's hearing range. We have seen no written enforceable commitment from the Atlantic Shores management to achieve a 10 dB broadband attenuation. Also as shown below there are significant technical problems in achieving such a large attenuation for the lower whale-hearing frequencies needed to protect right whales. In addition since noise source levels are not presented there is no way of measuring the noise level and verifying that a 10 dB attenuation is achieved in practice. Therefore the BOEM and the NMFS should not assume more than a 5 dB broadband attenuation. With that even using the questionable small exposure ranges and takes estimates critiicized in Save LBI's comments on the prposed rule the rule document admits that the project would cause Level A noise takes of the right whale absent mitigation. But as discussed below even that 5 dB is not applicable to the lower frequency situations involving the right whale and other LFC's.	Thank you for the comment. A section introducing some of the noise attenuation technologies has been added to the acoustic appendix for the final PEIS. Noise attenuation technology continues to evolve, and there are many options available today, either a single solution or a combination of solutions, that can reach 10 dB or more of noise attenuation from the unmitigated case (Bellmann et al. 2020). Examples of the growing number of noise attenuation solutions include the IHC-Noise Mitigation Screen, OffNoise Solutions GmbH’s Hydro-Sound Damper, the big bubble curtain or double bubble curtains (available from several suppliers), and the Grout Annulus Bubble Curtain. In addition, there are alternative hammer designs (e.g., IQIP-Pulse and Menck Noise Reduction Unit) that can be used to reduce the noise associated with impact pile driving over traditional methods. The commenter is referred to the Bellmann et al. 2020 technical report entitled, “Underwater noise during percussive pile driving: influencing factors on pile-driving noise and technical possibilities to comply with noise mitigation values” for details on the proven effectiveness of these systems alone or in combination with other systems.

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BOEM-2024-0001-0357-0065	Noise Source- Low Frequency Attenuation. Regarding pile driving the proposed MMPA rule project Application and the NMFS Biological Opinion are incomplete and flawed because they do not address attenuation in the most relevant frequency range for the right whale and other LFC's. In that regard it is not broadband attenuation that is critical here but attenuation of noise levels in the frequency range less than 1000 Hertz as this is the range that overlaps right whale hearing. Attenuating the sound at lower frequencies requires larger bubbles; and practical problems have been raised regarding the control of bubble size distribution and the production of a sufficient number of large bubbles (several centimeters) that are necessary to achieve efficacy at low frequencies (see Measurements of Construction Noise during Pile Driving of Offshore Research Platforms and Wind Farms Rainier Matuschek and Klaus Betke NAG/DAGA 2009 Rotterdam). More specifically in the study titled Underwater Noise Emission Due to Offshore Pile Installation: A Review Article in Energies June 2020 DOI: 10.3390/en13123037 by Tsouvalas of Delft University of Technology it was stated that "For piles with diameters larger than 6 meters that are used as foundation piles of offshore wind turbines the acoustic energy is radiated at frequencies between 100 and 400 Hz (Section 4.3). At such low frequencies the desired bubble radii to stimulate resonance range between 8 mm and 32 mm near the surface are between 14 mm (1.4 cm) and 50 mm (5 cm) at a water depth of 30 meters. The creation of bubbles of such large radii is rather difficult especially in the harsh offshore environment. Thus despite the role that resonance phenomena may play in sound absorption the wave reflection caused by the impedance mismatch between the seawater and the air bubble curtain seems to be the single most significant mechanism leading to noise reduction". As discussed above achieving a 10 dB attenuation would require an additional auxiliary system such as a double walled pile. Such a system was employed and measured in the Vashon Ferry Terminal report cited above. However a frequency analysis of the noise reductions between the unmitigated piled driving and the double wall pile shows e.g. in Figures 9c and 11a very little noise attenuation	Thank you for the comment. At the present time, there is no MMPA application for the PEIS. Noise attenuation technology continues to evolve, and there are many options available today, either a single solution or a combination of solutions, that can reach 10 dB or more of noise attenuation from the unmitigated case (Bellmann et al. 2020). Examples of the growing number of noise attenuation solutions include the IHC-Noise Mitigation Screen, OffNoise Solutions GmbH’s Hydro-Sound Damper, the big bubble curtain or double bubble curtains (available from several suppliers), and the Grout Annulus Bubble Curtain. In addition, there are alternative hammer designs (e.g., IQIP-Pulse and Menck Noise Reduction Unit) that can be used to reduce the noise associated with impact pile driving over traditional methods. As the commenter points out, near-field resonate systems can be tuned to target the reduction of sound at specific frequencies. This is an active field of research and the technology is continually evolving. The commenter is referred to the Bellmann et al. 2020 technical report entitled, “Underwater noise during percussive pile driving: influencing factors on pile-driving noise and technical possibilities to comply with noise mitigation values” for details on the proven effectiveness of these systems alone or in combination with other systems.

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	occurring below 1000 Hz in the right whale's primary hearing range and the addition of bubble curtains in Figure 11d does not change that. This was not unexpected because as discussed above much of that low frequency sound was re-radiated from the seabed and not affected by the double pile or the close to source bubble curtains. Therefore even such auxiliary systems will not provide significant attenuation in the low frequency range nor will bubble curtains.	
BOEM-2024-0001-0357-0066	[Bold: Consequently the BOEM and NMFS should assume no source attenuation in their calculations of exposure ranges and take estimates for the right whale and other low frequency cetaceans.] For higher hearing frequencies they should assume more realistic attenuation numbers less than 5 dB with technical justification for them. In light of all these noise attenuation limitations it would be irresponsible for the BOEM and the NMFS to simply accept the applicant's assurances that a 10 dB can or will be achieved and proceed based in large part on such a broad (frequency-wise) tenuous and unsupported assumption. [Bold: Many of the agency's positive conclusions have depended on that assumption. Therefore those conclusions in the project EIS's the MMPA rulemaking and the Biological Opinion need to be revisited.]	Thank you for the comment. A section introducing some of the noise attenuation technologies has been added to the acoustic appendix for the final PEIS. Noise attenuation technology continues to evolve, and there are many options available today, either a single solution or a combination of solutions, that can reach 10 dB or more of noise attenuation from the unmitigated case (Bellmann et al. 2020). Examples of the growing number of noise attenuation solutions include the IHC-Noise Mitigation Screen, OffNoise Solutions GmbH’s Hydro-Sound Damper, the big bubble curtain or double bubble curtains (available from several suppliers), and the Grout Annulus Bubble Curtain. In addition, there are alternative hammer designs (e.g., IQIP-Pulse and Menck Noise Reduction Unit) that can be used to reduce the noise associated with impact pile driving over traditional methods. The commenter is referred to the Bellmann et al. 2020 technical report entitled, “Underwater noise during percussive pile driving: influencing factors on pile-driving noise and technical possibilities to comply with noise mitigation values” for details on the proven effectiveness of these systems alone or in combination with other systems.
BOEM-2024-0001-0368-0001	I have grave concerns about many aspects of the installation of dozens if not hundreds of offshore wind turbines. Since your area of concern is the environmental impact of these projects I will restrict my comments to that. Regarding sonar which can be deadly I was presented with information that many tests have been performed and that any sonar being deployed is within "safe" parameters. I am not a scientist and I cannot dispute your findings but I think any reasonably thinking person can look at the vast increase in numbers	Thank you for your comment and your concern. The sonar implicated in any marine mammal injury (primarily long distance anti-warfare sonar) is not the same sonar being used for offshore wind surveys, which consists only of three types: 1) *Bathymetric mapping* uses multibeam echosounders to map the depth and shape of the seafloor and backscatter to interpret density of the top few centimeters of the seabed. All modern nautical and navigation charts depend on bathymetric mapping,

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	of dead sea mammals along the Jersey shore that occurred during increased use of sonar at the same time and make a logical correlation between the two. I simply cannot believe your argument.	which is conducted frequently (sometimes as much as annually in high traffic commercial passages) to ensure navigation data are accurate. Bathymetric mapping is also a key component in dredging, beach renourishment, and post-storm surveying to certify navigable waters. 2) Seafloor Imaging is another method of seafloor shape characterization; it typically uses side scan sonar for high-definition detail of the seafloor. This method is used in many applications, including underwater archaeology, coral reef mapping, wreck mapping, and hazard identification. For offshore wind applications, seafloor imaging is required by BOEM to identify all potential archaeological sites (e.g., shipwrecks), fish habitats such as hard bottom communities or sand ridges, and other sensitive habitats that cannot be disturbed as part of the offshore wind development. 3) *Sub bottom profiling* not only acquires data for the surface of the seafloor but also penetrates several meters into the seafloor for a picture of subsurface materials and geology. Sub bottom profiling is used regularly for sand source identification and characterization for beach renourishment and restoration activities along the entire Eastern seaboard. Identification and monitoring of these sand resources through sub bottom profiling is critical to maintain ongoing sand resources for coastal resilience, particularly after storms such as Hurricane Sandy. Sub bottom profilers include CHIRP Sonar (which is the same type of sonar method used in the “fish finders” common on commercial and recreational fishing vessels). There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers

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		University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0381-0002	What will the underwater cables noise/vibrations ships etc. do to the marine life all along the eastern seaboard?	Underwater noise effects on marine mammals from various noise sources, including vessel and cable laying activities, are discussed in detail in Section 3.5.6.3.3 of the PEIS.
BOEM-2024-0001-0394-0002	The findings of federal scientists at NOAA-Fisheries (National Marine Fisheries Service) were that the project represented a threat to the continued existence of the North Atlantic Right Whale. The agency wrote a letter in May of 2022 to BOEM recommending for harm mitigation a buffer zone bounded on the east by the depth line where the Nantucket shoals depth measures 30 m and extending southwest for 20 km (12 mi). There was a big expos by Bloomberg News in November of 2022 that BOEM was not heeding the federal government's own scientists at NOAA-Fisheries. The Mayflower DEIS reveals that BOEM ruled out doing this because it considers the power purchase agreement to have irretrievably committed whatever portion of the lease area is necessary for power production outlined in the agreement which was formed in 2020 three years before conclusion of the environmental inquiry as to the project's effects. This means the decision as to whether to commit ocean resources to any specific purpose is being made ahead of the environmental review which examines what the environmental consequences will be. This runs counter to the intent of the environmental law.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis. Additionally, the findings of the Hayes (2022) memo were included in the impact assessment discussion of this PEIS.
BOEM-2024-0001-0394-0004	We also found examination of effects on migratory birds in the DEIS to be inadequate. Many birds use infrasound for essential migration timing ensuring that energy expenditure does not exceed energy reserves and that deadly storms are avoided. There have been 3 dead right whale calves this year showing NOAA's lack of care towards whale populations and reducing speed limits for recreational vehicles jet skis and tourist whale watching vehicles. Many states (with the exception of Massachusetts) have not updated their recreational sea vehicle speed limits at all. Moreover unlike in	There have been no reported vessel strikes from offshore wind vessels during any preconstruction or construction activities to date. Vessel transits are monitored electronically and by on-board observers, and all sightings of ESA-listed whales must be reported regardless of whether any strike avoidance was required. There is no causal connection between recent offshore wind development and large whale mortality, and such assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is

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	Europe the NOAA does not provide fishermen free gear and tackle to reduce risks to whales. Instead they impose burdens on fishermen who continue to try to make a living despite increasingly crowded waters and now wind turbines that don't work. Wind turbine parts cannot be recycled. Their cable causes whale entanglements and death. Their blasting also causes whale death in addition to school confusion and changed migration patterns. If you develop these wind turbines you will be signing the death warrant of the right whale.	not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities. Additionally, effects of cable emplacement and maintenance, UXO detonations, and decommissioning from the proposed NYB projects are considered in this PEIS both without mitigation (Section 3.5.6.4) and with mitigation (Section 3.5.6.5).
BOEM-2024-0001-0425-0006	The approval of the within NY Bight Industrial Wind Turbine Project without independent peer reviewed scientific research on the negative impacts upon marine mammals and in particular the North American Right Whale is violative of the Endangered Species Act and NEPA. True science involves constantly emerging new evidence and findings along with the everchanging challenges imposed as to prior conclusions. As such contrary to the non-scientific "group think" and massive amounts of money driven public relations press releases behind the current wind turbine projects such sentiment ignores scientific methods of ongoing experimenting at the very least through realistic peer reviewed scientific pilot projects. True science involves constantly emerging new evidence and findings. This process necessarily continually involves the ongoing application of extensive scientific research which is then applied to the previously accepted theories. Such a true application of peer reviewed science especially applied to growingly obsolete wind turbine construction would support the revision if not rejection of prior dogma as to allegedly "settled science". As I have testified previously only from a partially facetious standpoint the rush to judgment approach as to this specific proposal to construct massive windfarms off New Jersey represents non-scientific "group think" with the devastating	Thank you for your comment. BOEM used the best available science to address impacts in the PEIS, but will take this comment into consideration as it administers its program. This PEIS does not approve or disapprove any projects; that will occur during the project-specific COP-level NEPA analysis.

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	potential to trample upon scientific inquiry and research. Such immense pressure from those supporting such colossal development of this offshore industrial site off of the precious New Jersey Coast unfortunately has facilitated many knee-jerk feel-good reactions which totally ignore the required economic and scientific vetting process. During a prior era particularly relevant to the coast of New Jersey our town and I were subjected to enormous pressures exerted by those supporting ocean dumping generated by a foreign corporation's pipeline off our beautiful and incalculably valuable portion of the New Jersey shore. Similar subconscious and actual influences are once again being exerted in favor of a foreign corporation looking to create another potential ocean dumping site off New Jersey's shoreline. I would truly beseech BOEM officials to rise above the narrow bureaucratic rubber-stamping of the within proposal in favor of the true application of scientific method to the entire cumulative and indirect impacts of the current project as well to windfarms off of New Jersey's Coast in general. Just as one heartfelt objector testified in a virtual hearing as to the threats proposed by foreign corporations to our country's national symbol the bald eagle these threats are very real whether proposed by a non-American entity or a corporation based in our own country. An even more appalling aspect of the within proposal can be seen in the lack of scientific method and any good faith attempt at a complex economic evaluation to be applied to the critically threatened North American Right Whales. This species is in dire jeopardy due to this specific proposal and the threat of pollution generating windfarms proposed to be constructed directly in the right Whales' primary and sole migratory waterways off the New Jersey Coast. With approximately three hundred fifty (350) North Atlantic Right Whales left in the entire world the DEIS barely touches the surface as to the potentially devastating if not terminating impact of this vast industrial project itself and numerous ongoing adverse impacts presented. From a noise perspective pollution generating standpoint and otherwise the construction operation and totally ignored dismantling and decommissioning process of the gigantic wind turbines themselves has insufficiently been addressed. Moreover the	

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	Draft Environmental Statement does not recognize the legal and moral standing of such an invaluable threatened species whose inspirational value beauty and potential worth as to biodiversity for our planet and to life itself cannot be overstated. How outrageous is it that this entire species of the North Atlantic Right Whales in all likelihood is being condemned to extinction by this juggernaut of industrial windfarm construction in this treasured creature's only habitat and migratory living pathways. What arrogance and true ignorance of science has been presented! What is the value of this species now being wiped off the face of the earth?	
BOEM-2024-0001-0469-0009	In the Draft PEIS section on marine mammals BOEM states that impacts from the presence of structures would likely be minor for non-North Atlantic right whale mysticetes and odontocetes but the appendix on incomplete and unavailable information indicates that it is unclear how large marine mammals will respond to the presence of "extensive networks of new structures" in their environment. [Footnote 20: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT appx. E at E-6.] For the North Atlantic right whale ("NARW") BOEM discusses the precarious status of the species and risks OSW presents such as stress response from vessel noise auditory masking and vessel strikes. [Footnote 21: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at ES-11 3.5.6-24-25.] BOEM projects that impacts to the North Atlantic right whale could be as high as "major" because the population's high mortality rate low fecundity and small size make it so that "all human-caused mortalities have the potential to impact their population status". [Footnote 22: Id. at 3.5.6-10.] Given the dire status of the North Atlantic right whale any impacts to the species are unacceptable.	Thank you for your comment. BOEM used the best available science to address impacts and assign impact-level determinations in the PEIS.
BOEM-2024-0001-0469-0010	Because marine mammal hearing is difficult to study animals are often grouped based on anatomy rather than studying the hearing of specific species and how they may be impacted by surveying activities and construction noise. [Footnote 23: Id. at 3.5.5-9.] There is a particularly glaring data gap regarding baleen whale hearing. [Footnote 24: Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Site	Thank you for your comment. BOEM acknowledges data gaps in marine mammal hearing studies in Section 3.5.6.1.3 of the PEIS, and the marine mammal hearing groups used throughout follow the scientific recommendations from NMFS (2018) and Southall et al. (2019), which incorporate the best available data on marine mammal hearing to date.

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	Characterization Surveys Off New York New Jersey Delaware and Maryland 89 FR 753 761 (Jan. 5 2024) ("no direct measurements of hearing ability have been successfully completed for mysticetes").] A 2015 University of Santa Cruz study indicated that pinnipeds were more sensitive to high-frequency noise than was previously predicted. [Footnote 25: Kane Cunningham Pinniped Hearing in a Changing Acoustic Environment U.C.S.C. ESCHOLARSHIP (2015) https://escholarship.org/uc/item/737223k8] The same study outlined a myriad of factors that could affect how noise travels in the marine environment suggesting that frequency is far from the whole story of how noise reaches and affects pinnipeds. [Footnote 26: Id.] In section 3.5.6.1.3 of the Draft PEIS the majority of the references are to studies that are more than ten (10) years old; some date as far back as 1985. [Footnote 27: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 3.5.6-13-21.] This speaks to how little is currently understood especially given that proposed OSW development has increased exponentially in the New York Bight in a short amount of time. Changes to a population or species can happen quickly so if BOEM has an underdeveloped understanding of marine mammal species' current status the agency cannot accurately plan for future protections and mitigation of potential impacts. This makes it even more concerning that New York Bight projects are expected to have "major" impacts to scientific research surveys. [Footnote 28: Id. at ES-12.] NOAA has reported that this will increase uncertainty in assessments for fisheries and endangered species consultation: "By disrupting NOAA Fisheries survey programs and the advice that depends upon them regional wind development will result in major adverse impacts on U.S. fisheries stakeholders including fishermen and fishing communities and the American public who consume American seafood and who also expect the recovery and conservation of endangered species and marine mammals." [Footnote 29: NOAA Technical Memorandum NMFS-NE-291 Fisheries and Offshore Wind Interactions: Synthesis of Science at 184 (March 2023)	

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	https://repository.library.noaa.gov/view/noaa/49151/noaa_49151_DS1.pdf]	
BOEM-2024-0001-0469-0011	Moreover marine mammals have been stranding off the coast of New York and New Jersey in larger numbers than normal since December 2022 remaining elevated through March 2023 and spiking again in summer 2023. [Footnote 30: MARINE MAMMAL STRANDING CENTER Current Cetacean Data https://mmsc.org/current-cetacean-data (last visited Mar. 12 2024); Alexandra George Why Have So Many Dead Whales Washed Ashore Along the New Jersey New York Coasts in 2023? ABC EYEWITNESS NEWS (Sept. 1 2023) https://abc7ny.com/climate-change-dead- whale-beached-tri-state-area/12901186/.] This correlates in time to OSW pre-construction activities but it is unclear what role the OSW activities may have played if any because there was no independent region-specific study commissioned on marine mammals in the New York Bight despite COA and many concerned citizens and elected officials calling for one. Whatever the cause of the increased marine mammal mortalities it is clear that the marine environment is already experiencing stress which makes it even more important to use the precautionary principle proving no harm before moving forward with an activity before adding more stressors in the form of surveying and construction noise vessel traffic and new networks of structures. BOEM concluded that the data gaps do not impede its ability to make a reasoned choice between the Draft PEIS alternatives despite also indicating that adverse impacts including injury or death to marine mammals and sea turtles could still occur because of the data gaps outlined in Appendix E. [Footnote 31: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 4.2-3.] The agency's conclusion is unreasonable on its face and especially so given the amount of other unanswered research questions and known risks arising from OSW energy development.	There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0473-0001	Please consider the following from RODA regarding offshore wind development: "There are opportunities for mutual wins however offshore wind development is an ocean use that directly conflicts with fishing and primary food production while imposing significant impacts on marine habitats biodiversity and physical oceanography."	Thank you for your comment. BOEM will take your comment into consideration as it administers its program.

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	As marine mammal deaths continue BOEM and NOAA have failed to "Thoroughly assess cumulative impacts of OSW to whales and other protected resources including all project phases and components and impacts to migration and food availability". Offshore wind is being advanced via excessive Incidental Harassment Authorizations and disregard for the MMPA and ESA. The Synthesis in Science report indicates "major gaps" in knowledge regarding the adverse impacts across nearly all manner of topics affected by offshore wind development. Environmental impact statements show connections between survey activity and an increase in vessel strikes and deaths due to construction activity yet agencies still profess there is no connection. There are contradictions across agencies and documents. Wind turbine failures and adverse impacts are finally coming to light around the world. I'm implore those with authority and integrity to halt further progress until assessments can be made of the damage already done since the installation of Block Island. I fully support the comments from Clean Ocean Action Save LBI and the plethora of other individuals and groups supplying data against further wind development.	
BOEM-2024-0001-0512-0001	I am commenting because I strongly oppose the proposed offshore wind lease areas in the New York Bight. As a concerned citizen of New Jersey I believe that these projects could have severe negative impacts on our communities and the surrounding environment. One of my primary concerns is the threat posed to endangered species such as the Atlantic Right Whales and other marine life. The construction and operation of offshore wind farms have the potential to disrupt crucial habitats and migration routes causing irreversible harm to what is an already vulnerable species. This ecological disruption would have far-reaching consequences for the delicate balance of our marine ecosystems.	Thank you for your comment. The PEIS discusses any potential impacts associated with the development of offshore wind within the NY Bight to protected species and the marine environment.
BOEM-2024-0001-0524-0001	The construction of wind turbines in the New York Bight poses a significant threat to the marine ecosystem particularly affecting numerous whale and fish species that frequent this area as reported by Gotham Whales. This includes several endangered species highlighting the critical nature of the threat. The use of sonar for seabed mapping in the region generates noise levels up to 226	There have been no reported vessel strikes from offshore wind vessels during any preconstruction or construction activities to date. Vessel transits are monitored electronically and by on-board observers, and all sightings of ESA-listed whales must be reported regardless of whether any strike avoidance was required. There is no causal connection between recent offshore

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	decibels at the source falling into the low-frequency range (LFI) which is within the hearing range of many whale and dolphin species. Analysis of NOAA data reveals a stronger correlation between the recent surge in whale mortalities and sonar mapping activities than with cargo ship traffic challenging the notion that increased ship traffic is the primary cause of these deaths. Statistical evidence further supports this argument. From 2020 to 2021 despite an 18.46% increase in ship traffic whale deaths astonishingly fell by 92.31%. The following year saw a 25.15% rise in ship traffic yet whale deaths still decreased by 53.85%. However a pivotal shift occurred from 2022 to 2023; ship traffic declined by 18.56% but whale deaths skyrocketed by 216.67%. This period coincides with a fourfold increase in surveying activities related to wind farm development leading to an alarming spike in whale fatalities in the New York/New Jersey area. Specifically 21 humpback whales perished which according to Gotham Whales' August 2022 count of 280 humpbacks in the region represents a significant loss of 7.5% of the population. Moreover NOAA's estimation that only one-third of whale deaths are detected suggests the actual impact could be even more devastating. These findings starkly contradict the argument that increased ship traffic is to blame for the rise in whale deaths. Instead they implicate the intensification of surveying traffic linked to wind farm development as a significant factor. Given that a substantial 7.5% of the humpback whale population in this region was lost in a single year and considering NOAA's admission that we may only be observing a fraction of the true number of fatalities it's clear that the environmental implications of proceeding with wind turbine construction in this sensitive area are profound. In addition each turbine will need:187 gallons of grease40 gallons hydraulic oil106 gallons of gear oil1585 gallons of dielectric fluid793 gallons of diesel fuel243 lbs of sulfur hexafluoride357 gallons Propylene glycol48 gallons Ethylene glycol This is not clean energy! This data mandates immediate comprehensive research and a cautious approach by both the Bureau of Ocean Energy Management (BOEM) and NOAA before any further development is considered.	wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities. The fluids and amounts required for turbine operation are provided in the PEIS.

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BOEM-2024-0001-0547-0007	Further BOEM's haste in approving the PEIS is in direct opposition to a longstanding federal protection program and in danger of disrupting a protected species that the federal government spent all this time and money to save from endangerment: the North Atlantic Right Whale protections. The North Atlantic Right Whale has been the subject of significant concern and federal protection. Since the U.S. government has spent close to $10M of taxpayer money to protect this endangered species why is this PEIS Project comprising six wind farm lease areas adjacent to the other projects already smack in the center of this federally endangered whale migration zone only nine miles from the Brigantine shore? [Footnote 19: See BOEM 2023-0030.] The cumulative effects of the vessel traffic and noise from BOEM's own PEIS is admittedly missing comparison with the mitigation effects and missing data such as NOAA takes [Footnote 20: See PEIS at D2-2; D2.9.1 at D-14; see also C-6 C-7.] and old outdated studies. [Footnote 21: Id. at D2-1; The Conservation November 15 2023 "As the US begins to build offshore wind farms scientists say many questions remain about impacts on the oceans and marine life." https://theconversation.com/as-the-us-begins-to-build-offshore-wind-farms-scientists-say-many-questions-remain-about-impacts-on-the-oceans-and-marine-life-216330 .] Therefore the mitigation measures fail - yet another reason for a No Action ruling.	See response to comment BOEM-2024-0001-0309-0006.
BOEM-2024-0001-0530c	Nobody listens to us. What about the effects of the survey areas? We've seen massive reductions in our fish populations and fish stock assessments since the surveying of the areas happened. This fall, all's we caught was dead scallops and dead clams and dead horseshoes in the areas that were once lively thresholds for all sorts of black sea bass, scup, summer flounder. And these things, whenever a survey vessel would show up, would disappear. The animals that couldn't get out of the way like the scallops, clams, and horseshoe crabs all died. And you're going to tell us that these vessels have nothing to do with the massive amount of whales and mammals that have washed ashore in the last year?	Potential impacts on scientific research and surveys are covered in detail in Section 3.6.7. NMFS and BOEM have prepared a Federal Survey Mitigation Implementation Strategy for the Northeast U.S. region (Hare et al. 2022) that describes impacts on fishery participants and on the conservation and recovery of protected species. This implementation strategy also defines stakeholders, partners, and other ocean users that will be engaged throughout the process and identifies potential resources for successful implementation through the duration of wind energy development in the Northeast U.S. region. BOEM is committed to working with NOAA toward a long-term regional solution to account for changes in survey methodologies as a result of offshore wind farms.

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		Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0528f	What kinds of sound decisions can be made if this monitoring cannot be completed prior to construction of one of the many projects along our coast? In this document BOEM listed potential for negligible to major impacts to whales. That is the full possible range of impact, confirming that the impact of our mammals is not in a fully known.	Thank you for your comment. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding potential impacts from offshore wind projects on marine mammals has been considered in this PEIS. Additionally, given the programmatic nature of this assessment, BOEM expects project-specific analyses of noise and other effects will be conducted during subsequent project NEPA stages that will further address specific, quantitative effects from offshore wind development of these projects. Further, the Final PEIS analyzes AMMM measure MM-3, which would require lessees to conduct long-term PAM or contribute to a research fund to support PAM on the lease area for 1 year before construction through at least 3 years but no more than 10 years of operations. If MM-3 were adopted as a COP T&C, then this data could be used to support additional analysis on noise impacts on marine mammals.
BOEM-2024-0001-0528f	Agencies that claim there's no evidence leaking these deaths to offshore wind have not provided evidence otherwise, or any scientific support for such a statement. The lack of due diligence in investigating cetacean deaths and transparency is alarming, to say the least. Without this long-term baseline data we cannot begin to determine causality from marine mammal deaths or other environmental impacts we are bound to see.	There is no causal connection between recent offshore wind development and large whale mortality. This assumption is contrary to the overwhelming scientific consensus that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). These determinations are based, in part, on published necropsy results. NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities. For additional information on these UMEs, see https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events.

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BOEM-2024-0001-0528w	In the required appendix on incomplete and and unavailable information, the P.EIS shows multiple concerning data gaps. Data on the distribution of multiple species of whales and dolphins is lacking. The effects of electromagnet magnetic fields on benefit communities, sea turtles, and marine mammals are not well understood. For baleen whales, BOEM is extrapolating the effect of the effect of pile driving noise from studies on responses to air guns, and little research at all has been conducted on sea turtle hearing. Scientists do not know how marine mammals will will respond to the presence of artificial structures in their environment. A pilot project would have been the only way to determine this beforehand, which is why COA has long advocated for a pilot project before full scale development.	Thank you for your comment. The Final PEIS uses the best available information and complies with the procedural requirements of NEPA to predict potential impacts on marine mammals. An acknowledgment of uncertainty about the impacts of EMFs is included in Appendix E, *Analysis of Incomplete or Unavailable Information*. Future research about EMF exposure on marine organisms may be incorporated into future project-specific COP NEPA analyses as information becomes available. Further, BOEM considered but dismissed from further consideration an alternative to build a pilot project (PEIS Chapter 2, Table 2-3). Data from sites that are constructed and operating (e.g., Block Island) as well as the pilot project in Virginia were incorporated into this PEIS and will be incorporated into the development of project-specific COPs and EISs.
BOEM-2024-0001-0528w	At the in-person meeting in New Jersey we learned that BOEM made compromises on the amount of baseline, passive, acoustic monitoring it would require to accommodate the expeditious timeframe of offshore wind development.	Thank you for your comment. BOEM believes that a 1-year baseline is sufficient for the NY Bight region because there are ongoing PAM efforts already underway in NY Bight that could provide more than a 1-year baseline. Additionally, the Final PEIS analyzes AMMM measure MM-3, which would require lessees to conduct long-term PAM or contribute to a research fund to support PAM on the lease area for 1 year before construction through at least 3 years but no more than 10 years of operations. The requirements in this AMMM measure are consistent with previously applied COP T&Cs.
BOEM-2024-0001-0529f	My other point of view is, why does BOEM need to give, take charts or provide take charts to these wind companies? New York wind companies, allowing them to kill so many marine life. In the beginning, NOAA said wind development, sonar testing or the wind turbines would not affect the whales. Now they come out and say, oh, yes, they will affect the whales, they will harm the whales or harass the whales, but they will not kill the whales. But if you talk to any marine biologists, they will tell you a harmed whale, or harassed whale is a dead whale. These whales that you want to show that are	Thank you for your comment. There is no evidence of death or serious injury from offshore wind pre-construction surveys or from offshore wind pile driving or offshore wind vessel strike. The greatest transformational threat to the marine ecosystem is climate change. Please refer to response to comment BOEM-2024-0001-0528f for more information on recent marine mammal strandings. As documented in Section 3.5.3, presence of birds in the offshore environment is low; therefore, BOEM anticipates that the risk to birds from offshore wind development and operations would be

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	struck by something, are struck by boats and other marine things because they are fleeing for their lives from the noise that the wind farms are creating. Let's start telling the America the truth about what wind turbines will do to our ocean floor and our fishing industry. So please start telling America the truth. Stop giving, take charts. You gave take charts out in out, in, out in the inland and said they could kill so many birds, and they're far surpassing the amount of birds that they were supposed to kill. And now these wind farms are being fined for it. Same thing is going to happen to our whales. 68 dead whales, is on your hands.	low. Potential collisions and disruption of behavior and flight patterns are addressed in Section 3.5.3. Potential impacts on federally threatened and endangered birds are addressed through the ESA Section 7 requirements.
BOEM-2024-0001-0528ee	I'm a conservation biologist, and I'm very concerned about offshore wind development, especially regarding its impact on whale populations. We have seen an unprecedented increase in whale strandings in the New York and New Jersey area over the past 14 months which directly corresponds with offshore wind vessel activities in our area. So, while many say that there's no evidence linking offshore wind to the recent whale deaths, no one is at the same time, no one is providing evidence that offshore wind activity is not a contributing factor to these strandings. So, we, I feel we definitely need to have more studies on the potential impact that offshore wind will have not just on marine mammals, but on all marine life prior to construction of these wind turbines. As it stands right now, scientists really do not know how the construction of thousands of wind turbines will impact the marine ecosystem.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0529n	According to 3.5.7-33 PES New York Bight, glauconitic sands may be present in New York Bight lease areas depending on the classification of the glauconitic sands present, there could be challenges associated with potential offshore wind development in these areas. Specifically. Specifically, some glauconitic sands are difficult or even impossible to drill through and cause high friction and increase noise during pile driving. Developers discovered glauconitic sands during construction installation, noise levels will likely increase as they determine if the	Thank you for your comment. The Final PEIS acknowledges the possibility for glauconite soils to be present in the NY Bight lease areas and identifies potential impacts associated with glauconite. Specifically, text within Section 3.5.5.5.1 (page 3.5.5-42) has been enhanced to discuss the correlation between the presence of glauconite sand and the potential need to use an increased level of hammer strike energy during pile driving operations for WTG installation. Additional details will be addressed at the COP-specific NEPA stage.

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	glauconitic is possible. We need to know if glauconitic exists before any construction begins. Developers need to be required to disclose this prior to any IHAs being issued, considering sound may be much louder, leading to higher mortality.	
BOEM-2024-0001-0529o	For example, in this document, BOEM lists the potential for negligible to major impacts to whales. That is the full possible range of impact. Confirming the impact to marine mammals is not fully known. Even assuming a moderate cumulative impact will cause more harm than the species can handle. So how do you gauge and plan monitoring mitigation efforts when you don't know what to expect?	Thank you for your comment. Substantial scientific data exist for offshore wind development that allow assessment of impacts. All available information regarding potential impacts from offshore wind projects on marine mammals has been considered in this PEIS. Additionally, given the programmatic nature of this assessment, BOEM expects project-specific analyses of noise and other effects will be conducted during subsequent project NEPA stages, which will further address specific, quantitative effects from offshore wind development of these projects.
BOEM-2024-0001-0529o	Over the past 13 months, 99 cetaceans, including 38 whales and 61 dolphins and porpoise have died just in the New York New Jersey Bight that we know of. That does not include the countless others outside the Bight or the ones we could not locate records for, or that never washed ashore. Agencies that claim that there is no evidence linking the deaths to offshore wind have not provided any scientific support. The lack of due diligence in investigating the cetacean deaths and transparency is alarming, to say the least. COA is concerned that these grim headlines can be more common without proper investigations into how the construction and operation of these concrete and steel jungles in the ocean will affect marine habitats and behavioral responses, such as feeding, mating, and migration patterns. We owe it to the many vulnerable and endangered species of marine mammals, sea turtles and fish to understand the inevitable repercussions of building an obstacle course in their home. The ocean is without boundaries, and the increased noise, vessel traffic, and potential, chemical and electromagnetic field exposure that come with offshore wind infrastructure need to be investigated cumulatively to understand the total impact to a species.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0529p	I personally added up the IHAs. There are over 1 million takes on marine mammals for offshore wind, dating back to 2014. Why is anyone saying that offshore wind doesn't cause harm to whales	Authorized takes are based on modeling and are therefore likely proportional to but not the actual number of takes that *will* occur during activities. Authorized takes mean that the project may not

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	when we have legal documentation of offshore wind corporations requesting to cause harm to whales? What is this delusion? Is there some sort of miraculous plan to build offshore whale without vessels and pile driving? Are offshore, is offshore wind somehow different than the other vessels that are killing North Atlantic right whales?	exceed the authorized number of takes within the given time period of the issued permit. For example, from the published HRG survey PSO reports from multiple offshore wind development projects within the U.S. Atlantic Ocean, PSOs recorded 2,696 large whale detections; of these, only 68 (2.5%) were detections that met Level B exposure criteria (animal distance and source operations). Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0529t	In the required appendix on incomplete and unavailable information, the PEIS shows there are significant gaps in scientific knowledge of how the offshore wind industry will affect marine wildlife. Example, data on the distribution of multiple species of whales and dolphins is lacking. The effects of electromagnetic magnetic fields affect the communities, sea turtles and marine mammals are not well understood. For Baleen whales, BOEM is extrapolating the effect of pile, the effect of pile driving noise from studies on response to air guns, which is a different technology, and little research has been conducted at all on sea turtle hearing. Scientists don't know how marine mammals will respond to the presence of artificial structures in their environment. And outside of the PEIS, scientific research has also outlined multiple ways in which offshore wind poses risks to marine life. Increased vessel activity, noise, and in this particular geographic area, potentially changing the patterns of the North Atlantic Cold Pool, a unique seasonal temperature cycle that allows cold water creatures to thrive here.	Thank you for your comment. The Final PEIS uses the best available information and complies with the procedural requirements of NEPA to predict potential impacts on marine mammals. An acknowledgment of uncertainty about the impacts of EMFs is included in Appendix E, *Analysis of Incomplete or Unavailable Information*. Future research about EMF exposure on marine organisms may be incorporated into future project-specific COP NEPA analyses as information becomes available.
BOEM-2024-0001-0529t	Clean Ocean Action is not claiming, but there is definitive proof that offshore winds is the cause of the spike in whale deaths, but we also cannot rule out, offshore wind is a potential factor either because of the data gaps. This is why Clean Ocean Action has been calling for an independent peer reviewed scientific study. We need to conclusively determine why so many whales have been dying in the New York Bight.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.

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BOEM-2024-0001-0310c	So if fluke disappear what's -- where do they go? It's not going to be because of industrial offshore wind. They won't have the evidence to support that. We've seen that with the whale killings.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0310g	The last thing I would like, I'd like to add, BOEM, President Biden, Governor Murphy, the whales and dolphins sadly have been the canary in our coal mine. And I'm sorry it gets me choked up, but they are warning us of the coming dangers of what's going to happen to our ocean environment. I ask that you heed those warnings and stop offshore wind.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0310h	The unprecedented uptick in whale and dolphin deaths in the past 14 months is devastating, and all of them while offshore wind vessels were surveying nearby. While you deny any connection between offshore wind and the deaths, no full necropsies have been released meaning there is no evidence that there is not a connection. The Incidental Harassment Authorization is evidence. Level B harassment refers to acts that have the potential to disturb a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding, or sheltering. Level A harassment means any act of annoyance, pursuit, torment that has the potential to injure a marine mammal or marine mammal stock in the wild. It is certain death and it is an invasion of their ocean.	There is no causal connection between recent offshore wind development and large whale mortality. This assumption is contrary to the overwhelming scientific consensus that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 are primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0310j	I am here representing those without a voice, our whales. I am very concerned about the impact that the proposed offshore wind projects will have on our humpback whale population in the New York and New Jersey waters. Over the last 20 years, from 2002 to 2022, the average number of humpback whale strandings in New Jersey is 1.47 per year. Now that suddenly changed in the last 12 months. From December 2022 to December 2023, there were 11 dead humpback whales off New Jersey, and ten humpback whales dying off New York waters. In New Jersey, that's a 750 percent increase in the number of dead whales in one year. Just think about that for a second. 750 percent increase. This major increase in the number of whale deaths doesn't just happen by accident. Many people, myself included, do not think	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.

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	that it's a coincidence that the whales started dying off New York and New Jersey waters when offshore wind surveying activity in our ocean was at its highest. We hear from NOAA all the time that there is "no evidence that offshore wind activity has contributed to the recent uptick in whale deaths," but this really isn't a scientific response and it's not good enough. Is there evidence that offshore wind activity is not causing these whale deaths? That is really the question we need to have answered. It's imperative that we find out what is causing this massive increase in whale deaths before any more projects are approved. Humpback whales like all whales are protected under the Marine Mammal Protection Act. Because of the alarming and unprecedented increase in whale deaths, all activity that can potentially be contributing to these deaths must be halted until a full and thorough investigation can be completed. There also needs to be baseline studies of the current humpback whale population in the New York and New Jersey waters conducted along with a pilot study to determine the environmental impact prior to offshore wind construction.	
BOEM-2024-0001-0310m	Give us time to -- give us more time, because we'd like to take away your take authorizations	“Take” of a marine mammal is a term that is specifically defined under the MMPA and the ESA. While the PEIS analyzes impacts on ESA-listed species, the “taking” of a marine mammal is not determined through NEPA but through the MMPA or ESA. For clarity, BOEM does not authorize any permits or takes. Only the NMFS has this authority through the ESA or MMPA. To date, offshore wind developers have not applied for, and NMFS has not approved, any authorization to kill any marine mammals incidental to offshore wind site characterization surveys or construction activities. Authorized takes during construction in finalized authorizations have been limited to Level A and Level B takes by acoustic harassment.
BOEM-2024-0001-0310n	We have been fed lies about an "unusual mortality event" that started in 2016 and how it's unrelated to the offshore wind activity because "construction wasn't even started yet." We were fishing when surveying activity started in late 2015 and has increased dramatically from a few survey vessels occasionally surveying to	Thank you for your comment. The scientific community has determined that the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales).

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	dozens of survey vessels working around the clock in the past year and a half. We see our fishing grounds disturbed and our stocks leave the area as soon as the survey vessels show up. We are catching an unprecedented amount of dead clams, scallops, horseshoe crabs and other shellfish in areas that have been surveyed.	
BOEM-2024-0001-0529gg	Also, some are saying, we have never seen whales die, and I think it's very important that the PEIS, identify when the unusual whale mortality event started, which was in 2017, way prior to any offshore wind exploration ever occurred.	Thank you for your comment. The scientific community has determined that the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales).
BOEM-2024-0001-0310s	Just -- just seeing over the past year the amount of mortality that's happened because of this preconstruction. They're not even building the things yet, you know. Sound can do a lot of things to creatures on this planet. And, you know, what happens when they start pounding these pilings in, you know? That's even worse from what I'm seeing. All the research that I've been looking at on computers and books and libraries, I get to it and at the very end there's 12, 15 pages of where they got their information from. Did they actually go out and do anything? No. They took somebody's report, put it into another report. Look what I got, you know.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0310s	What's happening with the sonars, they're putting sounds in the water that they don't recognize, which I guess puts them in a panic and sorry it's not a direct correlation, but interferes with their migration. Their, you know, everything that they live for, and it maybe it causes a boat strike, but it wouldn't have happened if that noise wasn't there and they didn't recognize it, you know. It's like somebody coming up and bashing you on the side of the head, you know.	Most sonar used for HRG surveys are actually outside the low-frequency hearing group (Ruppel et al. 2022). There is no causal connection between recent offshore wind development and large whale mortality. This assumption is contrary to the overwhelming scientific consensus that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined that the three declared UMEs for whales in 2016 and 2017 were primarily caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for the minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine

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		mammal mortality has been attributed to offshore wind activities.
BOEM-2024-0001-0310u	For heaven's sake, do an investigation on the whales. You know, what the heck. What's the, you know, what is the problem? Do an investigation. You haven't provided the evidence. We don't have evidence that it did, but we are -- we think it's plausible.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.
BOEM-2024-0001-0529jj	Since 2017, NOAA Fisheries has permitted, or is considered, or is considering permitting 108 vessels to conduct geophysical survey activities over more than 10,000 survey days, resulting in more than 113,000 instances of harassment, level B takes of marine mammals. And we all know that these, this type that was from NRDC themselves, and in a letter to BOEM. And we all know that takes our harassment. You can, everybody knows that a deaf whale is a dead whale, and if a whale loses its calf, they search for each other for eternity. What you're doing is an atrocity, and it needs to stop.	Authorized takes are based on modeling and are therefore likely proportional to but not the actual number of takes that will occur during activities. Authorized takes mean that the project may not exceed the authorized number of takes within the given time period of the issued permit. Consideration of takes that occur as a result of these projects is better characterized by PSO reports. For example, from the published HRG survey PSO reports from multiple offshore wind development projects within the U.S. Atlantic Ocean, PSOs recorded 2,696 large whale detections; of these, only 68 (2.5%) were detections that met Level B exposure criteria (animal distance and source operations).
BOEM-2024-0001-0529kk	I can tell you that for decades, I have followed the Center for Coastal Studies out of Cape Cod and they do whale research. And they, major killers of whales are ship strikes and entanglement in fishing gear. And that is not new. That is decades and if we don't address climate change, we don't have to worry about the whales, we have to worry about anything because we're unleashing chaos.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0528f regarding recent marine mammal strandings.

P.5.11 Sea Turtles

Table P.5-11. Responses to Comments on Sea Turtles

Comment No.	Comment	Response
BOEM-2024-0001-0175-0003	[Bold: Cable Emplacement:] According to the NY Bight Draft PEIS 3.5.7-38 [Underline: Severe injury or mortality for sea turtles] "Cable emplacement and maintenance: Under six NY Bight projects the total area of seafloor disturbance would increase due to the substantial increase in the number of cables installed and maintained in the NY Bight area. Additionally construction of six NY Bight projects would increase the amount of dredging equipment and activities used during installation of the cables. As discussed in Sections 3.5.7.3.3 and 3.5.7.4.1 direct impacts from dredging particularly entrainment typically result in severe injury or mortality for sea turtles". How is this protecting the ocean's environment and sea life?	Thank you for your comment. The text in Section 3.5.7.4.2 referenced in this comment is specific to Alternative B, which assesses the risk of impacts without the AMMM measures. The Proposed Action in this PEIS is Alternative C, which includes the application of AMMM measures to reduce potential adverse effects on sea turtles from the NY Bight projects. Additionally, this PEIS does not approve or disapprove any projects; this would occur during the project-specific COP-level NEPA analysis.

P.5.12 Wetlands

Table P.5-12. Responses to Comments on Wetlands

Comment No.	Comment	Response
BOEM-2024-0001-0313-0050	5.8.5.1 Impacts of One Project The PEIS states "Requiring developers to consider how to adjust project design to minimize impacts on environmental resources such as by siting onshore infrastructure to avoid wetlands or using HDD to pass underneath sensitive wetlands could reduce overall wetland impacts (MUL-23). The site selection of the onshore landfall and substation locations and the onshore cable routes would have the highest influence on the magnitude of impacts on wetlands. Impacts of Alternative C could be less than those of Alternative B on wetlands due to potentially less disturbance to wetlands; however the AMMM measures do not eliminate the potential for more substantial wetland impacts. Additionally compliance with federal state and local wetland regulations which would apply to any alternative would also require the avoidance and minimization of wetlands impacts. Therefore Alternative C is not anticipated to have a meaningful change in	All proposed NY Bight projects will be required to demonstrate compliance with the NEPA process along with other applicable environmental laws, such as Section 404(b)(1) Guidelines of the CWA. A thorough analysis of potential impacts on wetlands resulting from alternatives would be evaluated once projects are identified. BOEM anticipates that onshore infrastructure components would be intentionally located in disturbed or developed areas (e.g., along existing roadways and ROW) to avoid and minimize potential impacts on wetlands. In addition, the onshore interconnection cables would likely be installed underground using trenchless construction techniques such as jack-and-bore and HDD at wetland and waterbody crossings, where feasible, to further avoid impacts on these resources. All activities would be required to comply with federal, state, and local regulations

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	impacts compared to Alternative B. The impacts for the land disturbance IPF under Alternative C would not be different than for Alternative B which would range from negligible to moderate due to the unknown locations of onshore project components and extent of wetland impacts those project components would incur. MUL-18 involves the use of shared transmission infrastructure among the NY Bight lessees and is therefore only applicable to the analysis of six NY Bight projects." Comment It is concerning that there is no meaningful analysis of potential impacts to wetlands and that it appears to be segmented from the environmental review by being deferred to the COP which based on multiple reference in the PEIS is not a required document though it appears that the potential adverse impacts should be part of the PEIS in terms of the larger plan of scale. Further this mitigation measure is very vague and thus prevents consideration of impacts and comments for consideration. Affected Environment and Environmental Consequences 3.6.2-7	related to the protection of wetlands by avoiding or minimizing impacts. If impacts would not be entirely avoided, mitigation would be anticipated to compensate for wetland loss. Applicants would identify compensatory wetland and stream mitigation based on the requirements of USACE, the New York State Department of Environmental Conservation (NYSDEC), and/or NJDEP as part of the Section 404 permitting process. MUL-23, which proposes developers consider how to avoid or reduce potential impacts on important environmental resources by adjusting project design, is currently an RP for consideration.

P.5.13 Commercial Fisheries and For-Hire Recreational Fishing

Table P.5-13. Responses to Comments on Commercial Fisheries and For-Hire Recreational Fishing

Comment No.	Comment	Response
BOEM-2024-0001-0063-0002	Impact on Fishing: The New York Bight is a vital area for commercial and recreational fishing. The presence of wind turbines will restrict fishing activities leading to economic losses for the local fishing industry. It will DESTROY our fishing industry!	Thank you for your comment.
BOEM-2024-0001-0089-0002	Other problems include the referencing of work submitted by organizations that have benefitted directly from Orsted such as Montclair State University Woods Hole Oceanographic Institute and others. There are numerous insta where impacts that would result in most any commercial endeavor taking place in the ocean waters in the case of this EIS for offshore wind have been dismissed as negative or minimal impact.	The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. Future research conducted may be incorporated into future project-specific COP-level NEPA analyses as information becomes available.
BOEM-2024-0001-0122-0001	I am opposed to offshore wind and here is why! A primary issue revolves around the anticipated disruption to the local fishing industry where the displacement of traditional fishing grounds and	Thank you for your comment. The NY Bight lease areas were designed to avoid certain commercial fishing activities, based on stakeholder input and task force meetings held from 2017 to 2021.

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	the creation of physical barriers could significantly impact the livelihoods of fishermen.	
BOEM-2024-0001-0122-0003	Impact on Fisheries: Offshore wind farms will disrupt traditional fishing grounds leading to the displacement of fishing activities. The construction and operation of wind turbines will interfere with established fishing routes impacting the livelihoods of fishermen.	Thank you for your comment. The NY Bight lease areas were designed to avoid certain commercial fishing activities, based on stakeholder input and task force meetings held from 2017 to 2021.
BOEM-2024-0001-0331-0007	Many officials have been warning us of the risks of rushing thought the approval and construction of the offshore wind projects. BOEM has approved projects despite repeated warnings from the National Marine Fisheries Service about damage to the environment and fishing industry. NMFS has stated that "we are building the ship while sailing it. " The NJ Department of Environmental Projection Official has stated " We are learning as we go."	Thank you for your comment.
BOEM-2024-0001-0331-0016	The New York Bight covers 488000 acres in addition to the 423184 acres of the other offshore wind projects in the NY/NJ area. This is a total of almost a million acres of wind development activity destruction of our ocean and marine life. According to BOEM's table D-2 there will be 1103 wind turbines in the New York Bight which will be next to another 713 in contiguous lease areas. That is a total of 1816 wind turbines! There will also be a total of 6333 miles of export and interarray cables in the ocean for all projects. The cumulative impacts of the New York Bight as well as the other contiguous offshore wind projects will devastate the fishing industry and destroy a sustainable food source.	Thank you for your comment. There are several mitigation measures in place to reduce the cumulative impacts of the anticipated development in the six NY Bight lease areas. The identified AMMM measures applicable to commercial fisheries and for-hire recreational fishing are presented in Table 3.6.1-20.
BOEM-2024-0001-0331-0034	The PEIS Does Not Sufficiently Address Fishing Industry Impact and Proposed Mitigation Will Not Save the Industry The fishing industry has grave concerns over the impact of the project. Ed Baxter a commercial fishman with the Fishermen's Dock Cooperative in Point Pleasant Beach NJ claims "what we're really worried about is the cabling. It's death." According to Baxter "The offshore power cables and export cables coming ashore could potentially shut mobile gear fisheries like scallop dredging out of those routes if fishermen can't be safe that their gear won't snag on the cables." This is especially concerning because the Orsted Block Island Wind Farm of five turbines has had problems maintaining adequate sediment coverage over its cables. Problems with maintaining cable depth have been	Scallop dredge gear has penetration depths of 1–15 centimeters in sand and 1–35 centimeters in mud (Eigaard et al. 2016; Paschen et al. 2000). The minimum cable burial depth is 3 feet (over 90 centimeters), with a target depth of 6 feet, as outlined in Table ES -1. AMMM measure MUL-19 would require periodic post-installation cable monitoring, and protocols for cable maintenance are in place. The NY Bight lease areas were designed to avoid certain commercial fishing activity, based on stakeholder input and task force meetings held from 2017 to 2021. In Section 3.5.2-24, BOEM suggests the maximum temperature of discharge water from an HVDC converter OSS would be 90°F

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	reported with the ongoing Vineyard Wind project too according to Baxter. The New York Bight cable routes could run near an area called Mud Hole a shallow trench between the ship traffic lanes should of New York Harbor which is a very productive fishing area. Fishing in this area can all be endangered by offshore wind development. Fisherman are concerned too with future offshore substations and their cooling water systems which handle water at 86-90 degrees F along with a lack of transparency about anti-fouling chemicals that may be in the water systems. Seawater life pumps can accelerate the maturing process for larvae disrupt the natural process and can lead to high mortality rates and fish defects. Offshore wind structures will have their own SWLP capable of generating an average of 4-5.3 million gallons of water flow per day. This extreme power brings water and anything small enough to fit through the steel bar filters to the surface in minutes. BOEM has yet to document the temperature of the discharge water by the cooling systems although it claims that warm water effects on surrounding ocean are "likely to be extremely minimal". But there is no research to support this claim. Mitigation includes banking on engineering advancements but there is no confirmation on the effects. The entrainment of ichthyoplankton during operation is based on outdated NOAA National Centers of Environmental Information (NCEI) electronic database. Estimates are from NOAA's Marine Resource Monitoring Assessment and Prediction (MARMAP) program from 1977 to 1987 and by the Ecosystem Monitoring program from 1995 through 2017 throughout the North Atlantic region. Based on BOEM reporting on entrainment the mortality for plankton is assumed to be 100%. Higher water temperatures typically accelerate species' lifecycles including but not limited to lobser egg production cod egg development pollack spawning monkfish egg disintegration and haddock eggs.	(32°C), which was modeled to result in a 1.4°F (1°C) water temperature increase up to 155 feet (47 meters) from the discharge point (TetraTech and Normandeau Associates, Inc. 2023). In Section 2-7, BOEM acknowledges chemicals such as bleach (sodium hypochlorite) may be used in order to prevent growth in the system and keep pipes clean (Middleton and Barnhart 2022). The entrainment mortality assumes 100% of any organism entrained, not the number of organisms within the region.
BOEM-2024-0001-0331-0035	The Point Pleasant Fishing co-op claims that the tallies listed in the PEIS for the value of landings from the six lease areas between 2008-2021 are understated. The table was modeled using Vessel Trip Report and vessel logbook data to estimate catch and landings based on the percentage of a trip that overlapped with each lease area according to BOEM documents. According to Point Pleasant co-op	Thank you for your comment. BOEM uses the best available data from our partner agencies. Vessel Trip Reports are used, as they focus on the landings, value, and the ports used. The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS, including the most recent available landing data from

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	"The numbers are not averages. Instead they are taking the lowest year they can. NOAA Fisheries itself won't use Vessel Trip Reports data in stock assessment." BOEM must defer to the fishing industry and NOAA in determining the baseline statistics for fish catch and landings. Without accurate numbers the true impact and mitigation will be inaccurate and ineffective to say the least. The mitigation measures listed in the COMFIS-6 Table G-1 are not an acceptable solution to the fishing industry or the loss of a sustainable food source. Typical of BOEM in table 4.2-1 its document preparers recite their cookie cutter unrealistic conclusions about the impact of the offshore wind project on the commercial fisheries and for hire recreational fishing but fail to answer the question whether the fishing industry and a sustainable food source will survive offshore wind. "Based on the anticipated duration of construction and installation and O&M activities BOEM does not anticipate irreversible impacts on commercial fisheries and for-hire recreational fishing. The NY Bight projects could alter habitat during construction and installation and O&M activities limit access to fishing areas during construction and installation or reduce vessel maneuverability during O&M. However the conceptual decommissioning of the NY Bight projects would reverse those impacts. Irretrievable impacts (lost revenue) could occur due to the loss of use of fishing areas at an individual level."	NOAA and NMFS. Future data will be incorporated into future project-specific COP-level NEPA analyses as information becomes available.
BOEM-2024-0001-0332-0002	The offshore waters of the NY Bight (NYB) have long supported populations of coastal fishery resources (CFR) highly migratory fish species (HMS; e.g. tunas billfish mahi mahi sharks) and many fisheries that target them. Serving as a migratory corridor for numerous CFR and HMS (Galuardi and Lutcavage 2012; Vaudo et al. 2016; Kohler and Turner 2019) NYB is ecologically-important and contains Essential Fish Habitat (EFH; i.e. the waters and substrate necessary for spawning feeding and growth to maturity) for many economically important species as well as a handful of endangered and critically endangered species.	Thank you for your comment. See response to comment No. BOEM-2024-0001-0371-0028.
BOEM-2024-0001-0332-0003	Recreational Fishing Contributions NYB also contains historical fishing grounds for iconic species [Bold: and supports an extensive HMS recreational fishery in which thousands (NJ/NY Private Boat 6927 including charter/head boat the total is 7779; 2022 NOAA	Section 3.6.1 discusses commercial fisheries and for-hire recreational fishing. Additional discussion of private recreational fishing from shore or personal vessel can be found in Section

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	Fisheries HMS SAFE Report) of vessels participate each year]. In 2021 recreational anglers in New Jersey and New York contributed $4.2Billion in economic output and supported 28290 jobs. (Southwick 2021) Imagine the updated numbers due to inflation. A large portion of this recreational fishing effort occurs within popular fishing areas that have been leased for offshore wind development. The diversity of the rich fisheries and the threat from offshore wind development's impacts are not bound by lease area borders. The Socio-Economic Impact of OCS Wind Energy Development on Fisheries in the US Atlantic predates the NYB Leases. Therefore the economic impacts as well as a cumulative analysis of impacts to the fisheries must be completed for the entire region. [Bold: There must be a comprehensive assessment of baseline recreational fishing effort for both coastal CFR & HMS in NYB and the associated Wind Energy Areas.]At the recent NYB Draft PEIS BOEM public meeting (Feb 8th in Toms River) I reviewed the recreational fishing hand out and poster (3.6.1-22). I questioned subject matter expert Brandon Jensen (Fisheries Biologist at BOEM) [Bold: Why is the recreational fishing industry which I am part of largely left out in Section 3.6.1?]	3.6.8, *Recreation and Tourism*. The economic impact of wind development in the lease areas is discussed in Section 3.6.3. The NY Bight lease areas were designed to avoid certain fishing activity based on stakeholder inputs and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid conflict with fishing grounds (BOEM 2021). Figure 3.6.1-22 shows that the Prime Fishing Grounds have very little overlap with the NY Bight lease areas.
BOEM-2024-0001-0332-0004	3.6.1-38: "Based on NMFS data there is no substantial for-hire recreational fishing activity in any of the six lease areas." This is far from true. And due to this oversight Table 3.6.1-16 misrepresents the small business revenue from inside the NYB lease areas. The fishing hot spots known as the Resor Atlantic Princess Chicken Canyon Triple Wrecks and the Corvallis The Star 20/30 Fm Curve among others are all in the same area. Large fleets of 50-100+ recreational private vessels commonly congregate in small areas when tuna fishing. These same areas are popular sharking mahi cod and sea bass fishing areas. I can somewhat agree with "the most impacted species includes cod in OCS-A 0544 (NMFS 2023h) and bluefin tuna red hake and black sea bass in OCS-A 0538 (NMFS 2023j)." However the chart (3.6.1-22) poorly represents the recreational fishing effort with a long fishing history in the NYB and more specifically in the lease areas. There's more effort at the hot spots mentioned (in and around the NYB lease areas) than the Barnegat Ridge (also a fishing hot spot) which is painted with significantly more fishing effort. SEE ORIGINAL COMMENT FOR MAP.	For-hire recreational fishing activity has been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8.

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	In blue OCS-A 0538 is better known as owned by Attentive Energy. This 131.7 square mile lease area is located 42 miles east of Barnegat Inlet and 54 miles south of Fire Island Inlet NY. It is the summertime tuna fishing mid-shore grounds in addition to being home to a number of prominent wreck sites. There are major data gaps that the PEIS must consider. Recreation catch and effort data is severely lacking and there is little to no spatial data collected for recreational private boat anglers. MRIP through APAIS (Access Point Angler Intercept Surveys) collect catch per trip data do not record specific fishing spot/location data only the location of the intercept and the general area of fishing such as shore private for-hire. NOAA's own study finds their estimates are way off and their program needs an overhaul. [Bold: The lack of information on recreational fishing does not constitute a free pass for evaluating PRIVATE RECREATIONAL fishing impacts occurring in the leases.]	
BOEM-2024-0001-0332-0005	The state and feds largely do not know exactly where private anglers fish and do not know where these same boats transit unless monitoring AIS which the majority of private boats do not have. To learn more about this I believe that there must be work done now similar to what URI/CRMC/RISA did to determine where anglers are fishing and where anglers are from but must look at the broader area to obtain private recreation fishing effort in federal waters. BOEM must formulate recreational fishing surveys (not MRIP) that directly obtain recreational fishing information (even if qualitative) to help characterize the fishing activity within the lease areas. To do this developers should be required to collect data (survey and engage with the recreational fishing community). This engagement must come with significant oversight so that developers can't just check a box by doing nothing like they do now by relying on MRIP. Extrapolating private recreational fishing spatial data utilizing a fishing app like Fish Rules such as in Scott Steinback's (Economist with NOAA Fisheries) work is suspect. Many saltwater anglers know the rules before they go fishing. Some anglers may check the rules via app but the location when checking is not necessarily where they fished. It would be a different story if it was a fish catch logging app (like Fish Brain) that tracks the gps and needs a photo's metadata locations to acquire position. But still there are not enough anglers	Thank you for your comment. Individual developers will collaborate with private fishers through their fisheries representatives, who will convey applicable information to the developer during the project-specific COP-level NEPA analysis and COP preparation phase. The fisheries representatives would represent the needs of the fishing community. Private angling is further discussed in Section 3.6.8, Recreation and Tourism.

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	participating so the sample size is far too small. It is unfathomable that this amount of time and progress has passed without baseline data.	
BOEM-2024-0001-0332-0006	The Negative Reef Effect Production vs Aggregation Despite what Anglers For Offshore Wind promotes the majority of the recreational fishing community does not support offshore wind. Many of the anglers I talk to have major concerns. Not all marine life flourishes in a hard bottom ecosystem and it does not necessarily help NJ and NY anglers. It brings a lot of uncertainties to the table many of which management has no handle on. OSW is not a magical solution to help the fisheries fix climate change fix ocean acidification and the changing currents. It adds a lot of uncertainty and jeopardizes the ecosystem. Turbines are offshore fish attracting/aggregating devices which greatly increase fish catchability. This is stated in 3.6.1 as a benefit to for-hire recreational fisheries however this is a very large issue that fisheries managers must understand and manage properly. The fish will come from other fishing grounds and these concentrations will be easier and quicker to catch leading to localized and regional depletion. Overfishing can happen fast resulting in a closure of the fishery and then economic hardship follows. Or effort is turned to another species which stresses another fishery. "Some fisheries could experience substantial disruptions indefinitely even with the implementation of the AMMM (avoidance minimization mitigations monitoring) measures. "OCS Study BOEM 2015-037 3.2.3 Artificial Reef Aggregation: Many aspects of the fisheries resources communities within the wind energy areas are expected to be affected through habitat changes and the introduction of new structures; species abundance density composition diversity dominance size classes and productivity (McCann 2012; Rodmell and Johnson 2005). The introduction of new structure is expected to provide new habitat for species to colonize and aggregate around and the local communities are expected to change from non-structure based to structure based (BOEM DOE/EIS-0470 2012). Species compositions of artificial reefs have been found to differ from natural reefs and their presence can also affect the surrounding biodiversity thus areas outside the footprints of these wind energy areas may be impacted (Inger et al. 2009).At	Potential impacts on scientific research and surveys are covered in detail in Section 3.6.7. NMFS and BOEM have prepared a Federal Survey Mitigation Implementation Strategy for the Northeast U.S. region (Hare et al. 2022https://media.fisheries.noaa.gov/2022-12/TechMemo-292-revised-title-page_0.pdf) that describes impacts on fishery participants and on the conservation and recovery of protected species. This implementation strategy also defines stakeholders, partners, and other ocean users that will be engaged throughout the process and identifies potential resources for successful implementation through the duration of wind energy development in the Northeast U.S. region. BOEM is committed to working with NOAA toward a long-term regional solution to account for changes in survey methodologies as a result of offshore wind farms. The reef effect observed around foundations of offshore wind turbines may not be as beneficial as natural habitats; however, it is still beneficial, considering habitat modifications. An ecological halo effect is also noted from artificial reefs, including offshore wind turbine foundations. Reeds et al. (2018) found this distance to be about 15 meters. Fishers will not be restricted outright, as they are for European wind farms. However, situational and temporary closures for navigation and operational safety may require re-routing, especially during construction activities.

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	one offshore wind energy facility the species diversity was lower on turbines compared to nearby natural boulders indicating the artificial reef effect of the turbines was not as beneficial as having natural rocky habitat (Wilhelmsson and Malm 2008). Background research did indicate there may be potential positive impacts if these areas have exclusion zones the areas may act as marine protected areas (MPA) for fisheries resources (Inger et al. 2009). Access can not be restricted!	
BOEM-2024-0001-0332-0007	Another negative reef effect is the altering and possibly stopping of the seasonal movement of fish to the inshore waters. This could impact availability to the non-boat-owning or only small boat owning inshore fishing segment of the public. Inshore/nearshore anglers (private rec for-hire party/charter) will lose opportunity if fish are aggregating around OFW structures. They will need to run further offshore which adds time and fuel costs. I classify this impact as an environmental justice issue since non-boat owners are most impacted and the mitigation solution is being focused on anglers who have the means to access the OFW structures in a private or for hire boat. Some can and will fish these areas on head boats and for-hire boats BUT that represents less that 9% of total trips. Land based trips represent the vast majority of fishing effort in the state of NJ in any given year and that mode (as well as the fishing tackle retail bait & tackle manufacturers boat builders and ancillary businesses) is expected to the bear the brunt of the negative reefing impacts. These potential losses and the environmental justice must be reviewed and included.	Thank you for your comment. While Section 3.6.1 discusses commercial fisheries and for-hire recreational fishing, additional discussion of private recreational fishing from shore or personal vessel can be found in Section 3.6.8, Recreation and Tourism. The economic impact of wind development in the lease areas is discussed in Section 3.6.3, and environmental justice is covered in Section 3.6.4.
BOEM-2024-0001-0332-0010	Safety At Sea Navigational Safety NOAA Fisheries 2022 Stock Assessment and Fishery Evaluation Report Atlantic HMS Section 7 Safety Data [Embedded Hyperlink: https://www.fisheries.noaa.gov/s3/2023-06/SAFE-Report-062223.pdf] must include updated information to include and evaluate the safety issues within the recreation fishery safety at sea fishing vessel risk assessment navigation through WEAs. From all documents I can gather this is totally overlooked. While this is outside the scope of the DPEIS: In March 23 2022 the NJ Marine Resources Administration was involved in dialogue with several other state/federal agencies regarding the need and appropriate size	The known artificial reefs of New York and New Jersey are shown in Figure 3.6.1-22. There are no mapped artificial reefs in any of the NY Bight lease areas considered in this PEIS. The project-specific COP-level NEPA analyses will address proposed export cable corridors that may be planned closer to the artificial reefs.

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	of a buffer between offshore wind turbines and artificial reefs and fish havens. Some of these reef sites have material right along the edge and commonly outside of the actual boundaries. There was discussion with the NJ MFC Offshore Wind Advisors which suggested 1-2NM buffer area to minimize damage to the reef habitat during construction from sound vibration sediment plums as well as safe drifting and transiting. With regards to NJ saltwater fishing 25% of all fishing trips occur on a NJ reef site and 65% of bottom fishing occurs on the reefs. There is significant effort and traffic in these areas. To the best of my knowledge this was largely ignored.	
BOEtM-2024-0001-0334-0008	Heavy metal content in our seafood is already a concern tarnishing the joy of eating seafood. Offshore wind installations are going to increase this threat to our seafood products from the near shores. (If our fishermen are even going to be able to operate with all the best fishing lands being inaccessible which we believe they will not). Any claim that the turbine bases will be fine fish habitat is absolute nonsense. We will not want to eat fish caught anywhere near the turbines. AND YOU CAN FORGET ABOUT MITIGATING THE LOSS OF COMMERCIAL FISHING CATCHES BY ESTABLISHING FISH FARMS IN THE WIND FARM LEASE AREAS. Here are some sea-ready offshore wind bases laced with sacrificial anodes. I was able to spot a few; see if you can locate them below: SEE ORIGINAL COMMENT FOR IMAGE of posts and New Sacrificial Anode and Degraded Sacrificial Anode BOEM should be concerned about this and calculate the concentrations of heavy metals that will be leached into a wind farm area and tell the truth about the abortion into creatures living there and the probably concentration into our seafood.	A study by Kirchgerog et al. (2018) demonstrated that in the North Sea, the use of aluminum anodes as opposed to zinc anodes would reduce the total annual emissions for an offshore wind farm with 80 WTG monopile foundations by a factor of around 2.5 (118 tons) due to the higher current capacity. Table 3.4.2-7 suggests AMMM measures to avoid using zinc sacrificial anodes on external components to reduce the release of metal contaminants in the water column.
BOEM-2024-0001-0346-0003	The Draft PEIS seems to consider itself able to proceed in the face of impacts on commercial fisheries that range from minor to major with the consolation that if a compensation plan is undertaken these major impacts might only be moderate. But the scallop fishery does not want to have to rely on compensation; instead the industry wants to continue to be able to fish safely on a vibrant and healthy Mid-Atlantic scallop resource that is centered in the New York Bight. And while NEPA might allow compensation as a way to mitigate adverse impacts compensation does nothing to protect the values that OCSLA affirmatively requires protecting. BOEM was wise to	Thank you for your comment. The NY Bight lease areas were designed to avoid certain commercial fishing activity based on stakeholder inputs and task force meetings held from 2017 to 2021. The Final PEIS includes a Fisheries & Benthic Habitat Monitoring Plan (COMFIS-3) AMMM, which addresses impacts on scallops, and RP COMFIS-5, which includes fisheries monitoring survey plans for before, during, and after construction.

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	develop a Draft PEIS to underpin New York Bight windfarm development; however if the Draft PEIS proceeds as currently structured it will not be setting future site specific NEPA and OCSLA analyses up for success as relates to the scallop fishery. The time is at hand for BOEM to develop and consider the fisheries impact minimization and pelagic habitat minimization alternatives in a manner that would enable the scallop resource and the scallop fishery to coexist in the New York Bight with offshore wind development.	Additional site-specific alternatives will be analyzed at the COP-specific NEPA stage, when more details will be known about each project.
BOEM-2024-0001-0346-0004	New York Bight Windfarm Lease Areas Are Centered on An Area of Major Scallop Productivity and Production The Draft PEIS definitively shows that the adverse impacts of wind farm development on the scallop resource and scallop fishery in the New York Bight will be far onto the "major" end of the spectrum. It is beyond reasonable dispute the scallop fishery will be the most adversely affected fishery from wind development in the New York Bight. From 2008-2021 the scallop fishery landed $236270000 in scallops from the six New York Bight lease areas. (3.6.1-11) [Footnote 1: This was 82% of the overall value of landings of $285087000 from what BOEM calls the "most impacted species." (3.6.1-12-13)] FSF repeatedly urged BOEM not to center offshore wind development atop historic Mid-Atlantic scallop beds. But BOEM knowingly went ahead and designated and leased those areas. And even among the six lease areas themselves those areas with the most potential impact on scallops and the scallop fishery are set to be among the first New York Bight lease areas to be developed. New Jersey just awarded power purchase agreements for two lease areas that collectively had over $100000000 in scallop landings between 2008 and 2021. Attentive Energy lessee of area OCS-A-538 has been awarded a power purchase agreement from New Jersey in its latest competition. According to NOAA Fisheries data a full $61925000 in scallop landings came from lease area OCS-A 0538. This was the most of any area. (3.6.1-11). Another $4131000 in scallops came from Invenergy lease OCS-A 0542 Invenergy being the second lessee New Jersey selected. (3.6.1-11)	Thank you for your comment. The NY Bight lease areas were designed to avoid certain commercial fishing activity based on stakeholder inputs and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid the mid-shelf scarp (BOEM 2021). Per the memo, “Specifically, in response to the commercial fishing industry BOEM excluded area adjacent to the scallop access area, included a buffer between select leases and removed areas of high value and benthic diversity.” Additional information is found in Section 5.1.4.1 of the memo. BOEM will evaluate project-specific impacts based on the project-specific COP before issuing a record of decision. The Final PEIS includes a Fisheries & Benthic Habitat Monitoring Plan (COMFIS-3) AMMM, which addresses impacts on scallops, and RP COMFIS-5, which includes fisheries monitoring survey plans for before, during, and after construction.
BOEM-2024-0001-0346-0016	Moreover the issue here is not about an impact over the entire range of the New England Fishery Management Council's authority over scallops. Rather it concerns the impact of six lease areas	Thank you for your comments. Suggested citations have been reviewed, and the Chen 2021 citation was added.

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	clustered tightly together in the center of the mid-Atlantic scallop resource. The question is whether these wind farms will disperse scallop larvae from areas of historical productivity (based on a combination of benthic and pelagic conditions) to areas that are less hospitable to scallop growth settlement and survival. As FSF previously explained in its comments on the New York Bight lease areas based on modeling conducted by Chen et al. [Footnote 6: See C. Chen et al. Assessing Potential Impacts of Offshore Wind Facilities on Regional Sea Scallop Larval and Early Juvenile Transports NOAA Grant Number: NA19NMF450023 (May 6 and 12 2021) (hereinafter "Share Day Report") (attached hereto in part as Exhibit 3; the full report is available at https://s3.amazonaws.com/nefmc.org/Doc.14.a-UMASSD_WHOI_short_report_05_6_12_2021_revison.pdf).] wind farms will alter patterns of scallop larval settlement. The Chen study was performed by researchers from the University of Massachusetts Dartmouth School of Marine Science and Technology ("SMAST") and the Woods Hole Oceanographic Institution ("WHOI") who modeled scallop larval flow around wind turbines. Using the turbine array plans for Vineyard Wind which is located near (but not adjacent to) a scallop access areathe Nantucket Lightship Scallop Access Areathe researchers examined the windfarm's future impacts on scallop settlement abundance and dispersion via oceanographic modeling. The presentation on this work provided at the 2021 Scallop RSA Share Day explained: Selecting 2010 and 2013 (two years with significant larval settlement in the Southern New England] region) as pilot study years we used the couple Scallop-IBM and NS-FVCOM/NECOFS model system to examine the impact of offshore WTG deployment in the lease area of OCS-A-501 on the dispersal and settlement of scallop larvae in the region. The preliminary results show that the WTGs can significantly enhance the mesoscale eddy circulation and turbulent mixing within and around the turbine area reducing the horizontal larval dispersion and pushing the larvae offshore. The model suggests that the impact of WTGs on scallop larvae in the SNE could considerably change the larval abundance in the Nantucket Lightship Closed Area (NLCA). Share Day Report at 2-3. Set forth below is Figure 9 from the RSA Share Day Presentation	

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	which demonstrates these impacts: SEE ORIGINAL COMMENT FOR FIG 9: Locations/abundances of settled super-individuals (left) and distributions of the settled larval density (right) in the SNE region for the cases with and without WTGs on November 30 2013. The black box indicates the Nantucket Lightship Closed Area. Gray dots are the WTG's locations.	
BOEM-2024-0001-0346-0017	The Share Day Report further explained the model output in the following way: The preliminary results show that the flow field significantly changed with WTGs. The flow tended to push the larvae offshore during the 2010 and 2013 simulation period (Figs. 8 and 9). The WTGs produced mesoscale flows and enhanced vertical mixing within and around individual WTGs which considerably reduced the horizontal dispersion around the wind energy development area. In those two years a large number of larvae were advected into the Nantucket Lightship Closed Area. Although larval behaviors play a critical role in the larvae dispersal and settlement by altering the flow-induced advection experienced at different depths the WTGs seem to significantly change vertical mixing and horizontal advection as well as horizontal turbulent dispersion. Using a so-called ensemble larval swimming behavior approach we calculated the mean percentage and deviation of settled scallop larvae for the cases with and without WTGs. Changes in the flow field due to WTGs tended to push the larvae together and advected them as a group offshore. As a result the settle percentage in the Nantucket Lightship Closed Area increased considerably. (Fig. 10). Share Day Report at 15. Figure 10 of the Report is copied below: SEE ORIGINAL ATTACHMENT FOR FIG 10: The mean percentage and standard deviation of settled scallop larvae averaged over 2010 and 2013 for the cases with and without WTGs. The calculation was done for ensembled results with diel and semidiurnal larval behaves in the ocean mixed layer. Black dots: locations of individual WTG. While these studies do not assess the potential impacts of windfarms in the New York Bight on scallop larvae the overall findings would indicate that impacts in this area should be expected to have similar effects on the aggregation and advection of larvae. Offshore wind development not only negatively affects the scallop resource it affects scallop fishing. Scallops are fished with mobile gear and	Thank you for your comment. See response to BOEM-2024-0001-0346-0016. The PEIS analyzed an RPDE with the closest spacing possible; however, more will be known at the COP-specific NEPA stage, when project specifics will be analyzed. The PEIS includes an RP that encourages lessees to propose consistent turbine layouts across adjacent lease areas as well as increased spacing as ways to reduce impacts. Lessees may propose greater spacing in their project-specific COPs to account for these concerns.

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	scallop vessels are among the largest vessels in the U.S. New England and Mid-Atlantic fishing fleet. Correspondingly they have the least opportunity to be able to maneuver and fish within a wind farm. In the depths of water that scallops are found in the New York Bight lease areas a scallop dredge is towed several football fields behind the fishing vessel. Thus AMMMs that require cable burial and avoidance of methods that raise the profile of the seabed (COMFIS-2 and COMFIS-4) will have limited utility for relatively larger bottom tending mobile gear fishing vessels because they will not be able to tow through wind farms with turbines spaced only 0.6 n.mi. apart. As the Draft PEIS concedes "Certain sectors of the commercial fishing industry will likely be at higher risk operating within an offshore wind farm (e.g. mobile gear such as trawls and dredges) due to maneuverability and entanglement hazards." (3.6.1-46)	
BOEM-2024-0001-0347-0003	General Recommendations: Environmental monitoring plans are a critical aspect to OSW projects. However we have noticed two challenges: lack of coordinated data sharing from OSW with fisheries scientists managers other entities and with the general public; and emphasize analyzing and understanding cumulative impacts. BOEM should utilize its authorities to require OSW developers share data that is useful to scientific efforts to better understand fisheries and potentially mitigate the unavoidable impacts from OSW on federal fisheries surveys. Through the programmatic approach in the NY Bight WEA we encourage BOEM to explore scientific opportunities to better understand cumulative impacts from OSW development in the NY Bight. There are extensive fisheries in and around the NY Bight. We encourage BOEM and developers to develop COPs to avoid and minimize the impacts to sensitive ecosystems physical fishing activities and navigation through leases to other fishing grounds. BOEM has included numerous AMMMs which would address this such as utilizing shared infrastructure among various projects. Recreational data will continue to be a challenge for BOEM NOAA Fisheries and other entities in assessing OSW impacts in the NY Bight. We encourage BOEM to seek additional data sources for improving the understanding of spatial and temporal recreational fishing effort in and around the NY Bight leases. The NY Bight serves as a migration corridor for many important fisheries. ASGA	Thank you for your comment. BOEM has included an RP, MUL-26, that encourages lessees to coordinate monitoring and survey efforts, meet regional data requirements and standards proposed by ROSA and RWSC, and make results from monitoring publicly available. BOEM encourages lessees to analyze and consider implementing RPs as they may further avoid and minimize impact; however, RPs are not part of the Proposed Action. Several other AMMM measures and RPs are included in the PEIS that could reduce potential impacts on sensitive habitats, highly migratory species and other fishes, commercial and recreational fishing, and navigation. BOEM agrees that additional information and available data could be used to help improve fisheries science and management.

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	encourages BOEM (through OSW Developers) to explicitly monitor highly migratory and other fish species before during and after construction. Requiring developers to affix acoustic telemetry receivers on OSW structures is one such example that could substantially improve fisheries science and management in addition to other marine mammals.	
BOEM-2024-0001-0352-0012	We recommend that all fisheries data be updated through 2023 in the final PEIS. The draft PEIS includes data through 2021 which is already three years out of date.	Data is updated through 2022 where possible, which is the latest that is accessible. Tables 3.6.1-6 through 3.6.1-13 only have data available through 2021.
BOEM-2024-0001-0352-0013	The potential benefits of MUL-25 which would require wider spacing of the area (1 nm in one orientation) seem to be underestimated. This could allow for easier transit and better search and rescue outcomes compared to narrower spacing and could have a material effect on fisheries operations. We are also concerned that the draft PEIS indicates wider spacing for six projects would have essentially the same impacts as for one project (Section 3.6.1.5.2). This evaluation seems to conflict with a statement made in the cumulative impacts evaluation: "BOEM anticipates that the cumulative impacts on commercial fisheries and for-hire recreational fishing associated with NY Bight projects when combined with impacts from ongoing and planned activities including offshore wind would be unchanged (negligible to major) because some commercial and for-hire recreational fisheries and fishing operations could experience substantial disruptions indefinitely even with these project-specific mitigation measures."	As described in Section 2.2, because the locations of turbines for the six lease areas are unknown, the PEIS analyzes a hypothetical project with the closest spacing possible for the turbine layout. The PEIS includes an RP that encourages lessees to propose consistent turbine layouts across adjacent lease areas as well as increased spacing as ways to reduce impacts. Lessees may propose greater spacing in their project-specific COPs to account for these concerns.
BOEM-2024-0001-0357-0019	Closer in we have commercial fishing losses to New Jersey ports on the order of $8 million over the project life. Farther out we may have a similar fish loss. Farther out we have scallop beds but they are predominantly outside of the Hudson South area. The scallop fishermen themselves have not called for no development in Hudson South but rather for a five nautical mile buffer zone in the southeast section of that area.	Thank you for your comment. See response to BOEM-2024-0001-0346-0004.
BOEM-2024-0001-0357-0022	To Fisheries: Neither this draft program EIS or any project specific EIS presents a cumulative assessment of the impact of all the contemplated projects on the fisheries fishing and downstream businesses and fish consumers. Each project area disturbs/threatens	See response to BOEM-2024-0001-0383-0008.

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	certain fisheries (e.g. scallop and surf clam beds) and depending on the turbine spacing eliminates their availability for harvesting. The reduced availability of accessible productive fields forces the fishermen to compete on the remaining limited areas and raises further questions on long term sustainability in accordance with the Magnuson- Stevens Fisheries Conservation and Management Act. The solution proposed in several project specific EISs is to provide a financial reparations plan to protect local fishermen for their reduced catch. But those project EISs include no assessment of the total loss of revenue and jobs nor to downstream businesses nor to the public from the reduction in fish harvesting across the wider geographic area.	
BOEM-2024-0001-0362-0003	Protect fisheries wildlife and marine ecosystems by utilizing data sharing the best available science and data and adaptive management strategies to avoid minimize mitigate and monitor environmental impacts;	Thank you for your comment. After further consideration, BOEM has removed MUL-24 from the Final PEIS.
BOEM-2024-0001-0383-0004	Fisheries baselines: The PEIS Appendix D describes ongoing activities for various resources considered by the PEIS and uses them to establish baseline conditions. Appendix D states that "The baseline conditions and trends described here serve as the basis for analysis of the No Action Alternative and cumulative impacts." [Footnote 9: Appendix D at https://www.boem.gov/sites/default/files/documents/renewable-energy/NY%20Bight_DraftPEIS_AppD_PlannedActivitiesScenario_508.pdf p. D-1.] However section D.2.9.2 Fisheries Use and Management BOEM specifies very little focusing on three state initiatives (one of which appears to take place in state waters only) and one ASMFC multiyear strategic plan. [Footnote 10: Ibid p. D-17 18.] All these initiatives are virtually inapplicable/unimpactful to fisheries in the New York Bight area of consideration. Instead BOEM omits the detailed data on fisheries regulation that occur in the area of analysis which restricts fisheries in time in space in quota etc. and truly provides the context for cumulative impacts. We have discussed this issue with BOEM for nearly a decade. Federally permitted and managed commercial fisheries cannot simply relocate activity- they are highly regulated and are subject to many spatial and gear restrictions that prevent fishing activity from "relocating"	The NY Bight overlaps two of NMFS's eight regional councils to manage federal fisheries: the Mid-Atlantic Fishery Management Council (MAFMC), which includes New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina; and the New England Fishery Management Council (NEFMC), which includes Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut. The Proposed Action's structures could affect accessibility or availability of fish and transit in the lease and cable areas, and it would therefore affect commercial fisheries and for-hire recreational fishing, to the extent that effort is removed from the area. Restrictions on maneuverability due to the presence of structures could displace some fishing vessels, increasing conflict over alternative fishing grounds. While the Proposed Action may affect all fisheries and all gear types, there are some gear types that may be more adversely affected. Bottom tending mobile gear is more likely to be displaced than fixed gear. The fixed gear fisheries, including the lobster and gillnet fisheries, are less likely to be displaced. However, some fixed gear methodologies, like the length of the pot trawl, may be modified to improve performance in a wind facility.

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	when a wind farm is sited on a commercial fishing ground. These are real impacts that should be analyzed as the baseline for commercial fisheries. This is particularly important when conducting the cumulative impacts analysis as the cumulative impacts of more de facto exclusion zones or restrictive areas resulting from offshore wind developments do not take place in a vacuum; they take place in the context of existing closure and restricted areas. However now this information is readily available to BOEM and must be incorporated into all analysis.	
BOEM-2024-0001-0383-0005	In 2023 the Council Coordination Committee (CCC) which consists of the leadership of all Regional Fisheries Management Councils [Footnote 11: See https://www.fisheries.noaa.gov/national/partners/council-coordination-committee.] in response to the Biden Administration's Executive Order 14008- the same Executive Order championed by BOEM in the New York Bight PEIS as part of the Purpose and Need of the Proposed Action-[Footnote 12: See PEIS at https://www.boem.gov/sites/default/files/documents/renewable-energy/_NY%20Bight_DraftPEIS_Vol1_Chapters1-4_January2024_508.pdf p. ES-4.] released a report on the Conservation Areas in the U.S. Exclusive Economic Zone to measure fisheries conservation efforts across the United States. [Footnote 13: See https://www.fisherycouncils.org/area-based-management.] We have included a copy of that report along with this comment. The report developed with standard methodology and scientific evaluation of expert Council staff analyzed the number of geographical conservation areas- defined under "Ecosystem Conservation" "Year-round Fishery Management" "Seasonal Fishery Closures or Other"- per fishery management region in the U.S. EEZ. [Footnote 14: See https://static1.squarespace.com/static/56c65ea3f2b77e3a78d3441e/t/6489c43523c0b1595a5b8d54/1686750280 097/Evaluation-of-Conservation-Areas-Report-2023.pdf p. 23.] The total number of conservation areas in New England is 47; the total number of conservation areas in the Mid Atlantic is 45 [Footnote 15: Ibid.] as of information available on March 31 2022. [Footnote 16: See https://static1.squarespace.com/static/56c65ea3f2b77e3a78d3441e	Please see response to comment No. BOEM-2023-0001-0383-0004.

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	/t/6489c43523c0b1595a5b8d54/1686750280 097/Evaluation-of-Conservation-Areas-Report-2023.pdf p. 11.] These fishery management conservation areas combined with no overlap account for 86.5% of the New England EEZ and 68.1% of the Mid Atlantic EEZ. [Footnote 17: See https://static1.squarespace.com/static/56c65ea3f2b77e3a78d3441e/t/6489c43523c0b1595a5b8d54/1686750280 097/Evaluation-of-Conservation-Areas-Report-2023.pdf p. 24.] Therefore the baseline conditions for commercial fishing are extremely restricted. Unlike offshore wind farms which have no spatial regulatory restrictions federally managed commercial fisheries are highly spatially restricted.	
BOEM-2024-0001-0383-0006	In particular 40.7% of the New England EEZ and 58.3% of the Mid Atlantic EEZ prohibit mobile bottom tending gear year-round. [Footnote 18: See https://static1.squarespace.com/static/56c65ea3f2b77e3a78d3441e/t/6489c43523c0b1595a5b8d54/1686750280 097/Evaluation-of-Conservation-Areas-Report-2023.pdf p. 25.] This is extremely important for BOEM to include as a baseline for offshore wind development activities as mobile bottom tending gear such as that used by Sea freeze vessels in particular will be unable to safely operate in a wind farm. Both the New England and Mid Atlantic CCC report analysis is applicable to the New York Bight PEIS as fisheries permitted by NOAA's Greater Atlantic Regional Office and managed by both the New England Fisheries Management Council and the Mid Atlantic Fisheries Management Council take place within the PEIS area. [Footnote 19: See https://www.fisheries.noaa.gov/about/greater-atlantic-regional-fisheries-office.] Charts of both the New England Fishery Management Council conservation areas and Mid Atlantic Fishery Management Council conservation areas are available in Appendix A of the CCC report.[Footnote 20: See https://static1.squarespace.com/static/56c65ea3f2b77e3a78d3441e/t/6489c43523c0b1595a5b8d54/1686750280 097/Evaluation-of-Conservation-Areas-Report-2023.pdf Appendix A p. 30-41 of 86.]We request that these be added to BOEM's fisheries baseline for all offshore wind development actions.	Please see response to comment No. BOEM-2023-0001-0383-0004.

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BOEM-2024-0001-0383-0008	Small Business Administration Regulatory Flexibility Act Analysis: In 2022 in response to BOEM's Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries the Small Business Administration's Office of Advocacy sent BOEM a very strongly worded letter stating that "BOEM must conduct a Regulatory Flexibility Act (RFA) analysis of its proposals to adequately understand the impacts of offshore wind development activities on small businesses... For all rules that are expected to have a significant economic impact on a substantial number of small entities the RFA requires federal agencies to assess the impact of the proposed rule on small entities and to consider less burdensome alternatives." We have attached the letter along with these comments and request that the RFA analysis be conducted as part of this PEIS as well as all BOEM actions. The SBA "heard from small commercial fishermen port operators marine equipment retailers onshore processors fish markets and other fishing industry representatives" and determined that "In addition to analyzing the direct impacts to commercial fisheries BOEM must also consider the direct effects on coastal communities and onshore marine businesses that rely on the commercial fishing industry for revenue. Any decrease in ladings results in a direct decrease in revenue for producers fish markets and marine supply gear repair and fuel shops." BOEM has never conducted such analysis in any of its documents. We request that this analysis be conducted as part of this PEIS and all other BOEM actions. BOEM cannot leave these impacts unaddressed; neither can it leave such analysis to the developer as the PEIS proposes. We discuss this below.	Thank you for your comment. Small business analysis is used as a proxy for the Regulatory Flexibility Act requirements. An analysis of impacts on small businesses is provided in Section 3.6.3. Revenue exposure cannot be quantified at the programmatic level but will be addressed during the project-specific, COP-level NEPA analysis.
BOEM-2024-0001-0426-0006	Will the turbines have any effect on our fishing industry and the people who have made their living in it for generations?	The analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas are provided in Sections 3.6.1 and 3.6.3.
BOEM-2024-0001-0447-0003	The alternative measures (AMMMs) for the NY Bight lease area only contains 3 Alternatives: No Action Defer Adoption of AMMMs or the Proposed Action of Adoption of AMMMs. The PEIS states that the cumulative impacts of Alternative C to finfish invertebrates and EFH range from negligible to major adverse as well as minor beneficial. The only way this conclusion could be reached is if it assumes that artificial reef creation will add to fisheries. But this would only	The analysis in Section 3.6.1 differentiates between the adverse and beneficial impacts on commercial fisheries and for-hire recreational fishing.

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	benefit recreational fishers. As we have continued to identify the commercial fishing fleet cannot operate in these areas with gear workable around these reefs. So recreational fishing consideration must be separated since we now assume this document realizes there is a major adverse impact to commercial finfish fishing and a possible benefit to recreational reef fishermen.	
BOEM-2024-0001-0447-0004	Secondly artificial reefs create exclusion zones for mobile bottom tending gear fisheries. Mobile bottom tending gear can hang up on existing reefs- whether natural or artificial- and cause gear loss/damage as well as safety situations. So the next assumption is that all clamming and scallop fishing will be impossible in these areas.	BOEM recognizes that the presence of structures and scour material can lead to entanglement or gear loss/damage. AMMM measures included in Appendix G provide measures to reduce this risk. Project-specific COPs may include additional measures proposed by the lessees.
BOEM-2024-0001-0447-0008	Mitigation and Spacing Also worth noting is the majority of fishing gear types will be unable to work in these arrays. Specifically gill net bottom trawls purse seine midwater trawls and clam and scallop dredges need at least a 2 nm spacing between each array. This has been shared countless time and to date has never been included in a design proposal. As such the PEIS should have considered a greater array spacing to allow commercial operation or assume these areas will be closed to most gear types fished in NJ commercially. Thus mitigation must be considered that includes the fact that these areas will be closed to commercial fishing.	As described in Section 2.2, because the locations of turbines for the six lease areas are unknown, the PEIS analyzes a hypothetical project with the closest spacing possible for the turbine layout. The PEIS includes an RP that encourages lessees to propose consistent turbine layouts across adjacent lease areas as well as increased spacing as ways to reduce impacts. Lessees may propose greater spacing in their project-specific COPs to account for these concerns.
BOEM-2024-0001-0452-0008	Artificial Reef Effect is Not Universally Beneficial to Commercial Fisheries BOEM continues to tout the benefits of“"artificial reef”" for commercial fishing and in so doing fails to demonstrate understanding of the differences between recreational and commercial fishing and different commercial fishing gear types and target stocks. Mobile bottom tending gear industry members have stated for years that natural and artificial reefs pose serious safety risks for operators and loss/damage to gear; therefore areas with potential for hang-ups from foundations and scour protection especially in tightly clustered arrays of 0.6 x 0.6 nm creates exclusion zones for mobile gear types. Moreover many commercially harvested species in the Bight require soft sand or mud substrate at various life stages and cannot survive in hard structure environments. Rather than qualitative unscientific statements regarding large-scale habitat conversion any discussion of this nature	See response to comment No. BOEM-2024-0001-0447-0003.

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	should provide specific details about affected stocks and operations with appropriate references. Introduction of hard artificial substrate should appropriately be identified as a major adverse impact to certain fisheries in the final PEIS.	
BOEM-2024-0001-0452-0015	Best Practices for Informing OSW Layouts In pursuit of its mission to achieve the best possible outcomes for U.S. commercial fishermen (and a healthy marine environment on which they depend) RODA has made extensive efforts to communicate directly with OSW developers. An example of constructive work between two industries was conducted with a lessee in the New York Bight on its project design. [Footnote 20: See ROD''s comments to the NOI to prepare an EIS for Empire Wind available at http://rodafisheries.org/wp- content/uploads/2021/07/210726-Empire-Wind-NOI_submitted.pdf] In situations where an OSW developer is genuinely willing to consider changes to its project design to accommodate a greater degree of fishing access similar exercises with regional fishermen prior to finalization of project design are likely to mitigate impacts. Opportunities for these approaches must be maintained in the final PEIS as a mitigation measure for projects.	Thank you for your comment. Additional site-specific NEPA analyses will be conducted for each of the six NY Bight projects once COPs are submitted and will allow for additional opportunities for mitigation.
BOEM-2024-0001-0453-0003	Page 78- Food Security Concerns The accumulation of West Coast fishing ground loss to OSW development will greatly exacerbate the serious ongoing problem of foreign fish imports to the U.S by Russian government activities of Russian fish reprocessing (laundering) and export to the U.S. by China enabling the Russians to increase military efforts to overthrow the legitimate government of Ukraine. As it is over 85% of U.S. consumed seafood is imported while California Oregon Washington and Alaska struggle to market domestic fish...Volume 3 Appendices - page 26: The first five California leases should serve as a demonstration project allowing sufficient time to study the performance and environmental and socioeconomic effects of these wind farms. This will allow adaptive management and avoidance of future problems.	Thank you for your comment. Analysis of California or west coast offshore wind development is not part of this NEPA analysis for the NY Bight PEIS.
BOEM-2024-0001-0453-0004	Socio-economic Impacts: Due to the size scope and number of federal and state agencies involved in regulating offshore wind development since 2018 California commercial fishermen and their	See response to comment No. BOEM-2024-0001-0453-0003.

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	associations have been inundated with requests for consultation. The time and energy to respond to each request for consultation has a fiscal impact and burden for fishermen who participate in ongoing and regular meetings about offshore wind development permitting processes and other activities. This also had a negative financial impact on their crew and families since fishermen are often not compensated for their service For those fishing industry leaders in this situation they must take time off from work to attend each meeting or consultation. This puts considerable strain and stress on fishermen who participate in the many consultations and meetings associated with offshore wind. Further most fishermen are self-employed and do not have funds to pay for staff or consultants' time participating in fisheries consultations and other offshore wind meetings. In nearly all consultations CEC has learned of the need to financially compensate fishermen for their time and expertise that they are being asked to provide. Further fishermen require resources to build their internal capacity and technical assistance to support their review of permitting and environmental documents data and materials related to offshore wind. The above is well crafted and provides questions which BOEM and the scientists they work with continue to discount. BOEM moves forward regardless of the consequences to our coastal waters and the marine biosphere. In addition there is no plan for avoidance with endangered and protected species of whales and seabirds in the siting construction and operational phases of OSW development. Loss or reduction of primary building blocks in the marine food chains such as phytoplankton or copepods due to OSW is an open question. It will likely remain so as it appears to be of no concern or consequence to BOEM when measured against the realization of their stated OSW goals. BOEM's use of the term "PEIS" is a misnomer. These are PEIS's in name only and the methodology formulated to support their pre-formed conclusions is not credible. Nor can it be without filling in the large data gaps instead of blithely ignoring their existence.	
BOEM-2024-0001-0474-0006	Among other reasons the action is Arbitrary because the proposed action will destroy and decimate the livelihoods of commercial and recreational fishers to the detriment of all citizens and members of the public. Among other reasons the action is Arbitrary because the	The purpose of the PEIS is to identify AMMM measures that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. The PEIS does not approve any projects. Each individual COP submitted by a

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	programmatic view does not accurately measure the cost of the destruction and decimation of commercial and recreational fishing and further the federal government actors have failed to urge New Jersey state government actors to protect such livelihood. Among other reasons the action is Arbitrary to the extent that New Jersey commercial fishers are denied equal protection of law in that New Jersey government actors have failed and refused to enact protections which are imposed by other state government actors such as creation of mitigation and remediation funds and commercial fishers in New Jersey will be harmed and impacted by the proposed action development of the offshore wind projects more than commercial fishers from other states in the same leasehold development area. Among other reasons the action is Arbitrary because the failure and refusal of the New Jersey government actors to protect commercial fishers is a dereliction of duty which the purported federal partners should address and correct as a proper mitigation action in light of the destruction and decimation of commercial and recreational fishing due to the proposed federal action as to which the New Jersey government actors weakly and wrongfully acquiesce. Among other reasons the action is Arbitrary because the destruction and decimation of commercial and recreational fishing will impact a critical food source impacting all citizens and members of the public and the Draft PEIS does not evaluate assess or mitigate such negative impact. Among other reasons the action is Arbitrary because the destruction and decimation of commercial and recreational fishing will impact a critical food source impacting all citizens and members of the public but the analysis in the programmatic review does not measure and address the public interest in preserving a critical food source.	developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the construction and installation, O&M, and conceptual decommissioning of the project, including cumulative effects.
BOEM-2024-0001-0512-0003	The fishing industry faces substantial risks due to the installation and formation of power cable networks and offshore substations which would make it impossible for them to continue fishing safely. This would disrupt valuable fishing grounds and unnecessarily jeopardize the livelihoods of countless fishermen and their families.	See response to comment No. BOEM-2024-0001-0474-0006.
BOEM-2024-0001-0530b	I basically looked at the fisheries effort -recreational fishing effort slide and explained and expressed my call it “anecdotal” opinion and information based on the recreational fishing effort that is shown	Thank you for your comment. Section 3.6.1 discusses commercial fisheries and for-hire recreational fishing. Additional discussion of private recreational fishing from shore or personal vessel can be

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	and depicted on the chart using some NOAA Fisheries information. To the best of my knowledge, that information is compiled from MRIP data and also VTR/eVTR reporting. The large portion of recreational fishing effort that I believe is being missed out on is due to the failures of MRIP, which are well known by NOAA Fisheries and it's being corrected at this time.	found in Section 3.6.8, *Recreation and Tourism*. The estimates of fishing pressure were obtained from NOAA's Marine Recreational Information Program, which is currently the best publicly available source of recreational fishing data. The analysis in Section 3.6.1 differentiates between the adverse and beneficial impacts on commercial and for-hire recreational fisheries, including the reef effect of the turbines. See the response to BOEM-2024-0001-0332-0004 regarding the location of recreational fishing activity within the lease area. Individual developers will collaborate with private fishers through their fisheries representatives, who will convey applicable information to the developer during the project-specific COP-level NEPA analysis and COP preparation phase. The fisheries representatives would represent the needs of the fishing community. Private angling is further discussed in Section 3.6.8, *Recreation and Tourism*.
BOEM-2024-0001-0530b	I believe there's a lack of recreational fishing dollars and cents there with regards to the GDP or economic contributions to GDP for the recreational side of things. I feel that you guys, or I should say, I feel that NOAA and BOEM has a handle on the for-hire and federally-inspected vessels. And that is due to the information coming from the VTR (the vessel trip reporting) and the eVTR (electronic vessel trip reporting) from the party head boat charter and all that. But I feel there's a pretty large gap due to the limitations of MRIP. And I feel that the recreational industry as a whole; that could be bait-and-tackle retail; that could also be tackle manufacturers; it could also be media, say magazines, video (there's a large subset of the recreational community that makes you know their money off the media side of things). They're totally overlooked in regards to this - in regards to this topic.	Thank you for your comment. Please see response to comment BOEM-2024-0001-0530b for more information on recreational fishing information.
BOEM-2024-0001-0530b	However, I look further east of there, very popular area 15 miles east is the Resor and another say five to 10 miles east of there, the Triple Wrecks, also north and also little south. If you basically draw a triangle between the Atlantic Princess, the Triple Wrecks, and the Resor you kind of have a triangle there that has a large amount of effort in the summertime for recreational anglers that are shark	Thank you for your comment. For-hire recreational fishing activity in the areas noted in the comment has been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8.

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	fishing and tuna fishing. There's also sea bass, cod, Mahi, Wahoo, sometimes Marlin - a lot of different things.	
BOEM-2024-0001-0528h	I will also say that there are no beneficial impacts to commercial fisheries in the area. The primary means of commercial fishing in that area is mobile tending bottom gear, which will be precluded from fishing in these areas. The fact that the spacing is about half a mile wide is completely ludicrous. It actually violates all of the other - I know coastguard recommendations in other areas. I would like to see an analysis on vessel transit through this lease area on a diagonal. Commercial fishing vessels are told all the time by BOEM that they are, you know, completely allowed to fish in these areas. Well, our trawl cables, which have the net behind the boat can be, you know, a quarter of mile to a half a mile long. Which would totally preclude any mobile tending bottom gear from fishing in this area. And any transit on a diagonal, that means that the spacing between the turbines and a diagonal is probably going to be about a quarter of a mile wide. Those types of impacts and complete exclusion of commercial fisheries in the area need to be analyzed.	Thank you for your comment. The PEIS analyzed a RPDE with the closest spacing possible; however, more will be known at the COP NEPA stage when project specifics are known. The PEIS includes an RP that encourages lessees to propose consistent turbine layouts across adjacent lease areas as well as increased spacing as ways to reduce impacts. Lessees may propose greater spacing in their project-specific COPs to account for these concerns. BOEM acknowledges that restrictions on maneuverability due to the presence of structures could displace some fishing vessels, increasing conflict over alternative fishing grounds, and that bottom-tending mobile gear is more likely to be displaced than fixed gear.
BOEM-2024-0001-0529f	Our fishing industry is about to lose its livelihood, because what you will do to the ocean floor will destroy the ability of our fishermen and women to fish. This not only affects the men out in the water, but affects the dock workers, it affects the packing plants, it affects the transport people, affects the fish markets. Who wants fish that's made, that comes from a foreign country. We need our fishing industry, and you need to stop this farce and tell the truth. Wind turbines will not have any effect on climate change.	Thank you for your comment. The analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas are provided in Sections 3.6.1 and 3.6.3. No single project can reduce GHG emissions enough to have a measurable impact by itself on climate change. The GHG emission reductions from one NY Bight project would contribute individually, in combination with all other GHG reductions, toward slowing the rate of climate change.
BOEM-2024-0001-0528z	The negligible effects on the most productive lucrative fishing grounds, are extremely concerning, not only within these lease sites, but also the placement of thousands of miles of VMF-laden cables that will be trenched through the ocean floor, plowing through plowing through these ledges and ridges that provide habitat is unthinkable.	Thank you for your comment. The analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas are provided in Sections 3.6.1 and 3.6.3, as well as AMMM measures and RPs that could reduce impacts. In Section 3.6.1, the Final PEIS describes potential impacts under the Proposed Action as negligible to moderate for commercial fisheries and for-hire recreational fisheries, and minor beneficial on for-hire recreational fisheries for either one or six NY Bight projects.

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BOEM-2024-0001-0528z	Habitats like the mud hole and monsters ledge in the New York Bight should be off limits.	Thank you for your comment. Prime Fishing Grounds of New Jersey, including the Mud Hole and Monster's Ledge, have been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8. BOEM will still conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP NEPA stage.
BOEM-2024-0001-0529n	We are going to destroy the economy of our coastal communities. People come to the shore for seafood and boating, both will be eliminated. Say goodbye to seafood. You want to talk about job creation. What about the generational jobs you're taking? Thousands of commercial fishermen will lose everything. The jobs that stem from this industry will be lost further draining the economies of our coastal communities. We're talking billions in GDP and billions in labor. Party boats will be a thing of the past. No fish for recreational fishermen, restaurants. The list goes on and on. Cumulative impacts equals cumulative assumptions. The negligible effects on the most productive lucrative commercial fishing grounds are extremely concerning not only within these lease sites.	Thank you for your comment. The analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas are provided in Sections 3.6.1 and 3.6.3, as are AMMM measures and RPs that could reduce impacts. In Section 3.6.1, the Final PEIS describes potential impacts under the Proposed Action as negligible to moderate for commercial fisheries and for-hire recreational fisheries, and minor beneficial on for-hire recreational fisheries for either one or six NY Bight projects.
BOEM-2024-0001-0529n	An area on the map shaded in green, a proposed fairway, the block marked Barnegat to Narragansett Fairway and separation area above and the block east of that fairway marked Hudson Canyon to Ambrose precautionary area. This area is an extremely lucrative fishing area for both the commercial and recreational fishermen. No cable substations and or cooling stations should be placed in this area, known as the Mud Hole. No cables, substations, and or cooling stations should be placed near Monster's Ledge.	Thank you for your comment. Avoidance of major OCS features was part of BOEM's planning process to identify lease areas (Section 1.2, Table 1-1, *History of BOEM planning and leasing activities in the NY Bight*), and none of the NY Bight lease areas are in the Hudson Canyon. Prime Fishing Grounds of New Jersey, including the Mud Hole and Monster's Ledge, have been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8.
BOEM-2024-0001-0310b	One of the main topics here basically I wanted to bring to the forefront is the recreational fishing contributions. New York Bight also contains historical fishing grounds for iconic species and supports an extensive high migratory fish species recreational fishery in which thousands as far as New Jersey and New York together Private Boat high migratory species permits that's 6927, and if you	Section 3.6.1 discusses commercial fisheries and for-hire recreational fishing. Additional discussion of private recreational fishing from shore or personal vessel can be found in Section 3.6.8, *Recreation and Tourism*. The economic impact of wind development in the lease areas is discussed in Section 3.6.3.

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	want to include charter/head boats the total comes to 7,779. That's based on NOAA 2022 Fisheries HMS SAFE report of vessels participate each year. So you see there's a large amount of participation effort here in the New York Bight in terms of recreational fishing. In 2021, recreational anglers in New Jersey and New York contributed $4.2 billion in economic output and supported 28,290 jobs. That's from Southwick 2021. All these, all my references cited here on the last page. Just imagine what these updated numbers would like look right now, you know, with the current state of inflation. A large portion of the recreational fishing effort occurs within popular fishing areas that have been leased out for offshore wind development. The diversity of the rich fisheries and the threat from offshore wind development's impacts are not bound by lease area borders. The socioeconomic impact of OCS Wind Energy Development on fisheries in the U.S. Atlantic predates the New York Bight leases. So therefore the economic impacts, that's a document, pretty heavy one that I believe is 2017. It's on the last page here. That's far before the New York Bight leases come out. So that needs to be relooked at, rehashed through call it. Therefore the economic impacts as well as a cumulative analysis of impacts to the fisheries must be completed for the entire region. There must also be a comprehensive assessment of baseline recreational fishing effort for both coastal fishery resources and also highly migratory fish species within New York Bight and the associated Wind Energy lease areas.	The NY Bight lease areas were designed to avoid certain fishing activity, based on stakeholder input and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid conflict with fishing grounds (BOEM 2021). Figure 3.6.1-22 shows that the Prime Fishing Grounds have very little overlap with the NY Bight lease areas.
BOEM-2024-0001-0310b	If you take a look at 3.6.1-39 based on National Marine Fisheries Service data, there is no substantial for-hire recreational fishing activity in any of the six lease areas. That's word-for-word quote. That couldn't be further from the truth. The fishing hot spots that I know as the Resor, Atlantic Princess, Chicken Canyon, Triple Wrecks and the Corvallis, The Star, 20/30 fathom Curve, are just a few amongst the same area that are fished regularly. Large fleets sometimes 50 to 100 plus recreational private vessels sometimes congregate in small areas when tuna fishing in the summertime. I can agree somewhat with "the most impacted species includes cod in the lease area of 544 and also bluefin tuna, red hake, black sea bass in lease area 538." However the chart 3.6.1-39 poorly represents the recreational fishing effort with a long fishing history	Thank you for your comment. For-hire recreational fishing activity in the areas noted in the comment has been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8.

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	in the New York Bight and more specifically in the lease areas. There's significantly more effort at the hot spots mentioned above as well as the Barnegat Ridge, which is also a fishing hot spot, which happens to actually be painted in this particular graphic or this chart. There are major data gaps that the PEIS must consider. Recreational fishing catch and effort data is severely lacking and there is little to no spatial data collected for recreational private boat anglers, which is Marine Recreational Information Program through Access Point Angler Intercept Surveys (APAIS) which collects catch per trip data do not record specific fishing spot or location data, only the location of the intercept and the general area where the anglers are fishing such as shore, private, for-hire. NOAA's own study finds their estimates are way off and their program needs overhauling. The state and feds largely do not know exactly where private anglers are fishing and do not know where these same boats transit unless monitoring AIS, which is not -- which the majority of the private fleets do not have.	
BOEM-2024-0001-0310b	I am concerned that turbines are offshore fish attracting/aggregating devices which greatly increase fish catchability. This is stated in 3.6.1 as a benefit to the for-hire recreational fisheries. However, this is a very large issue that fisheries managers must understand and properly manage. The fish will come from other fishing grounds and these concentrations will be easier and quicker to catch leading to localized and regional depletion. Overfishing can happen fast resulting in a closure of the fishery and then economic hardship follows. Our effort is turned to another species which stresses another fishery. It's kind of a domino effect. "Some fisheries could experience substantial disruptions indefinitely, even with the implementation of the AMMM," which for anybody who doesn't know and read these thick books with a lot of acronyms, it's avoidance, minimization, mitigation and monitoring measures.	Thank you for your comment. Sections 3.6.1 and 3.6.3 present the analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas, as well as AMMM measures and RPs that could reduce impacts. Potential impacts on scientific research and surveys are covered in detail in Section 3.6.7. NMFS and BOEM have prepared a Federal Survey Mitigation Implementation Strategy for the Northeast U.S. region (Hare et al. 2022) that describes impacts on fishery participants and on the conservation and recovery of protected species. This implementation strategy also defines stakeholders, partners, and other ocean users that will be engaged throughout the process, and it identifies potential resources for successful implementation through the duration of wind energy development in the Northeast U.S. region. BOEM is committed to working with NOAA toward a long-term regional solution to account for changes in survey methodologies as a result of offshore wind farms. The reef effects observed around foundations of offshore wind turbines may not be as beneficial as natural habitats; however, they are still beneficial, considering habitat modifications. An ecological halo effect is also noted from artificial reefs, including

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		offshore wind turbine foundations. Reeds et al. (2018) found this distance to be about 15 meters. BOEM acknowledges that restrictions on maneuverability due to the presence of structures could displace some fishing vessels, increasing conflict over alternative fishing grounds, and that bottom-tending mobile gear is more likely to be displaced than fixed gear.
BOEM-2024-0001-0310b	New York Bight leases are in the middle of the 20/30/40 fathom midshore offshore fishing grounds, which is some of the most productive fishing grounds and also home to a number of prominent/historic wreck sites. The area's sand ridges are home to abundant colonies of sand lance and I find them to be a quintessential link in the food web. They're not only forage to ground fish and pelagic species but also whales and sea birds.	Thank you for your comment. For-hire recreational fishing activity has been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8. Brief text about the sand lance has been added to Section 3.5.5.1.4. Impacts on seafloor habitats will also depend on the ambient conditions. For example, when ambient levels of suspended sediment and the degree of variation throughout the year are high, then the degree of impact from suspended sediment is likely to be less during that same year.
BOEM-2024-0001-0310b	There's a document here which I have a link to, which shows the strongest association of sand eels to sandy sediment, sand eels will most likely be negatively affected by the radical change in habitats when hundreds of turbines and thousands of tons of rock scour protection are added around the turbine and substation bases. If and when the sand eels leave, so do all of the other vital species.	Thank you for your comment. Brief text about the sand lance has been added to Section 3.5.5.1.4. Impacts on seafloor habitats will also depend on the ambient conditions. The addition of scour protection would result in short-term to permanent impacts on softbottom habitat within the project area and would impart minor impacts on finfish, including the sand lance, though localized impacts would likely be greater. Habitat conditions would be unaffected after construction is complete. Impacts from six NY Bight projects would therefore remain negligible to major.
BOEM-2024-0001-0310b	How can it be that no HAPC, habitat areas of particular concern, are designated within the New York Bight, yet summer flounder spawn in the winters on the Outer Continental Shelf and use the areas during all four stages of their life cycle (egg, larvae, juveniles as well as adults)? Many other coastal species rely on the Chicken Canyon and Hudson Canyon during one or more of their life stages and use the New York Bight's lease areas as well.	HAPCs are discrete subsets of EFH that are designated by the regional fishery management councils; represent high priority areas for conservation, management, or research; and are necessary for healthy ecosystems and sustainable fisheries. The HAPCs for the study area are shown on Figure 3.5.5-2, along with the NY Bight lease areas. No designated HAPCs are within the NY Bight lease areas; however, Section 3.5.5 discusses that summer flounder HAPCs may overlap with potential NY Bight offshore export cable corridors and vessel routes to the identified representative ports (see Chapter 2, *Alternatives*).

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BOEM-2024-0001-0310b	A lot of what was detailed in the very basic early work of Buchanan, which is a New Jersey DEP 2010 study was overlooked as well in the New Jersey Area of Interest wind power on the Outer Continental Shelf.	Thank you for your comment. The NY Bight lease areas were designed to avoid certain fishing activity based on stakeholder inputs and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid conflict with fishing grounds. (BOEM 2021). Figure 3.6.1-22 shows that the Prime Fishing Grounds have very little overlap with the NY Bight lease areas.
BOEM-2024-0001-0310c	McCann study in 2012 found that flounder was one of the few species that showed avoidance characteristics around the heavy EMF around these cables. Specifically it noted that flounder catches decreased around the high power turbines in Denmark. Now, flounder as I will tell you is the straw that stirs the drink at the Jersey Shore and for the recreational fishing community, which as another commenter noted is a multibillion dollar industry in New Jersey. Summer flounder migrate inshore and offshore twice a year. They come inshore in April, May. And that is the most important, the critically most important recreational species here at the Jersey Shore.	Thank you for your comment. An EMF analysis is provided in Sections 3.5.5.3.3 and 3.5.5.4.1. Also, Sections 3.6.1 and 3.6.3 present analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas, as well as AMMM measures and RPs that could reduce impacts. The NY Bight lease areas were designed to avoid certain fishing activity, based on stakeholder input and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid conflict with fishing grounds. (BOEM 2021). Figure 3.6.1-22 shows that the Prime Fishing Grounds have very little overlap with the NY Bight lease areas.
BOEM-2024-0001-0310h	Thousands of miles of EMF laden cables buried on the ocean floor severely altering and decimating the homes of scallops, clams, flounder, lobster, crabs, et cetera. In fact, there's limited to no real world data concerning the negative impact this will have on a now thriving ecosystem.	An EMF analysis is provided in Sections 3.5.5.3.3 and 3.5.5.4.1. EMF exposure levels in the built environment are not expected to reach high enough energy levels to result in impacts on populations, and there is no evidence to indicate that EMFs from undersea AC or DC power cables negatively affect commercially and recreationally important fish species (CSA Ocean Sciences Inc. and Exponent 2019; Gill and Desender 2020; NYSERDA 2017; SEER 2022; Taormina et al. 2018). Additionally, RP MUL-39 proposes the electric shielding on underwater cables to control the intensity of EMF. The Final PEIS considers the best available data and information that reflect the state of the science at the time of publication of the PEIS. An acknowledgment of uncertainty about the impacts of EMFs is included in Appendix E, *Analysis of Incomplete or Unavailable Information*. Future research about EMF exposure on benthic marine organisms may be incorporated into future

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		project-specific COP NEPA analyses as information becomes available.
BOEM-2024-0001-0310n	We attend meetings and have our thoughts and comments ignored only to be shown BOEM'S cherry-picked data about how much we stand to lose only to see the actual financial figures at less than one-third of the realistic numbers. None of these economic figures taking into the cumulative effects of the decline of the commercial fishing industry. The jobs just don't end at the boat. Dock workers, mechanics, metal fabricators, truck drivers, restaurants and many shore side products we harvest. This is the last of the wild caught, organic, sustainably harvested protein on earth with one of the lowest carbon footprints. It astonishes me that in this day and age, with constant food insecurity issues, that we would jeopardize the harvest of some of the healthiest protein for a form of energy production that has proven itself to be unreliable, inefficient, expensive and fraught with endless failures.	Thank you for your comment. Sections 3.6.1 and 3.6.3 present analyses of the impacts on the fishing industry from potential development in the six NY Bight lease areas, as well as AMMM measures and RPs that could reduce impacts. Previously, lessees have entered into agreements to provide job training so that residents near these communities can benefit from the job creation. Turbine technicians, for example, are skilled jobs that are not temporary. Jobs that rely on tourism have been evaluated near an existing offshore wind project (Block Island), and it was found that there was no negative impact in that area, where the project is significantly closer to shore than the ones in this PEIS.
BOEM-2024-0001-0310o	The negligible effects on the most productive, lucrative fishing grounds are extremely concerning, not only within these lease sites. An area on charts known as the Mudhole has been heavily surveyed by multiple developers for export cable routes. This is an extremely lucrative fishing area for both the commercial and recreational fishermen. No cables, substations and/or cooling systems should be placed in this area. No cables, substations and/or cooling systems should be placed near Monsters Ledge. The cumulative impacts of these lease sites will decimate a healthy sustainable resource and industry.	Thank you for your comment. Prime Fishing Grounds of New Jersey, including the Mud Hole and Monster’s Ledge, have been added to Figure 3.6.1-22. Further information on private recreational tourism can be found in Section 3.6.8. BOEM will still conduct project-specific NEPA analysis of the COP for each lease area, which will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP-specific NEPA stage.

P.5.14 Cultural Resources

Table P.5-14. Responses to Comments on Cultural Resources

Comment No.	Comment	Response
BOEM-2024-0001-0255-0003	The NJ Council of Divers and Clubs (NJCD&C) is an organization of 14 sport diving clubs many individual divers and some sport diving shops. We would like to remind you that there are an estimated 3000 shipwrecks off New Jersey that have occurred in the last 300 years. Some of those wrecks are buried but those that protrude above the bottom are the reefs of New Jersey that are focal points for marine life and provide habitat and food for fish and sea turtles. They are also heavily fished and dove on and some may be of archaeological value.	Thank you for the information about historic resources present in the offshore marine environment. The commenter does not pose a question or raise issues with the environmental analysis.
BOEM-2024-0001-0313-0051	3.6 Socioeconomic Conditions and Cultural Resources The PEIS States "National Register Bulletin 38 (Parker and King 1990 revised 1992 and 1998) defines a traditional cultural property as a "[historic property] that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community." TCPs may be locations places or cultural landscapes and have either or both archaeological and aboveground elements." Comment Reviewing this definition of traditional cultural property above it is important to note that TOBAY Beach is part of the Town's cultural identity and as the crown jewel of the Town of Oyster Bay we are seriously concerned about the potential impacts to the viewshed quality of life noise and vibratory impacts impaired water quality larger plan of scale impacts direct and indirect impacts substantial disturbance throughout the water and land environments.	The PEIS analyzes effects on quality of life, noise, vibrations, and water quality in Section 3.6.3, *Demographics, Employment, and Economics*; Section 3.6.5, Land Use and Coastal Infrastructure; and Section 3.4.2, Water Quality. These effects will be further analyzed at the project-level NEPA review once a COP is submitted. Regarding the referenced Section 3.6 of the PEIS, BOEM does not intend to identify specific historic properties through this programmatic evaluation. Developers of individual leases will be required to make a reasonable and good faith effort in accordance with the Section 106 regulations and BOEM's survey guidelines to identify historic properties, including traditional cultural properties (TCPs). BOEM will assess results of these surveys to analyze the effects of each project—including visual, vibrational, and auditory effects—on historic properties during the COP-level environmental reviews. Thank you for identifying Tobay Beach as a potential TCP. BOEM will continue to consult with the interested consulting parties on the effects of individual proposed projects on this potential TCP.
BOEM-2024-0001-0357-0043	With respect to the projects visible impact on historic properties on Long Beach Island New Jersey: 1. Limits on the total project nameplate capacity to allow flexibility in turbine size and number 2. A turbine exclusion zone from shore of at least 17.2 miles consistent with what the BOEM has agreed to provide for New York State	The closest turbine would be located 20 nautical miles (37 kilometers) from shore, which satisfies the concern expressed in the comment.

Comment No.	Comment	Response
	emanating from the Beach Haven Historic District to reduce historic resources adverse visible impact and 3. A turbine exclusion zone of at least 17.2 miles consistent with what the BOEM has agreed to provide for New York State emanating from the Barnegat Light lighthouse to reduce historic resources visible impact.	
BOEM-2024-0001-0373-0001	Within the cultural resources geographic analysis area for New York Bight there are expected to be over one hundred (100) sunken military craft. These craft range in age from the late eighteenth to the twenty-first century. Several of these craft are owned by the Department of the Navy (DON) whereas the remainder are owned by other U.S. government agencies are foreign military craft or their country of origin is unidentified. The type of craft represented in the DON collection spans a wide spectrum including but not limited to wooden sailing vessels steamboats destroyers submarines and aircraft. All sunken military craft are protected from unauthorized disturbance by the Sunken Military Craft Act of 2004. While the larger study area hosts a large number of sunken military craft there are presently no known sunken military craft within the six lease areas themselves.	Thank you for the information regarding sunken military craft and the Sunken Military Craft Act of 2004. BOEM will require each lessee to conduct surveys to identify cultural resources as well as historic properties listed on or eligible for listing on the NRHP. BOEM will consult with the Naval History and Heritage Command (NHCC) to determine if any marine cultural resources are sunken military craft.
BOEM-2024-0001-0373-0002	The following comments specifically relate to the PEIS for your consideration.1. In the discussion of marine cultural resources the following is offered: "Based on known historic and recent maritime activity in the region the NY Bight lease areas composing the knowable Programmatic Marine APE have a high probability for containing shipwrecks downed aircraft and related debris fields that may be subject to potential impacts by seabed-disturbing activities from offshore wind development in the NY Bight area (BOEM 2012 2013)" (PEIS pg 3.6.2-7). Recommend adding the following sentence the intent of which is to acknowledge that some of these resources are likely protected sunken military craft: "A portion of these marine cultural resources are likely to be sunken military craft which are afforded protection against unauthorized disturbance under the Sunken Military Craft Act of 2004 (H.R. 4200 108th Congress: Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005)." 2. In the discussion of impacts related to anchoring (PEIS pg 3.6.2-13) please consider adding the Sunken Military Craft Act to the list of existing federal and state requirements to avoid impacts to maritime	Thank you for these comments. BOEM has revised Table 3.6.2-2 and Section 3.6.2.3.2 under the Anchoring IPF to include reference to the Sunken Military Craft Act of 2004. BOEM will continue to invite the NHHC to consult on each of the NY Bight COP reviews. Through the Section 106 consultation procedures for the COP review stage outlined in the Draft Programmatic Agreement for the NY Bight, the NHHC will be afforded the opportunity to review and comment on historic property identification, evaluation of NRHP eligibility, assessment of effects, and consultation regarding the applicability of avoidance or minimization measures and/or the development of mitigation measures and historic property treatment plans regarding potential sunken military craft.

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	cultural resources as it prohibits unauthorized disturbance to sunken military craft. 3. For Avoidance Minimization Mitigation and Monitoring (AMMM) measures directed at cultural resources specifically avoidance the following is provided: CUL-2: "BOEM establish and lessees comply with requirements for all protective buffers recommended by BOEM for each marine cultural resource (i.e. archaeological resource and ASLFs) based on the size and dimension of the resource. If an adverse effect cannot be avoided the lessee will be required to conduct further investigations to minimize or resolve effects on these historic properties." NHHC is requesting that BOEM codify the established minimum avoidance buffer of 50 meters (164 feet) around the outer detectable extents of any presumed or confirmed sunken military craft in toto regardless of location size and dimension of the resource. This avoidance buffer would never decrease in size but may need to be increased based on the character and sensitivity of the archaeological site in question. If avoidance of a sunken military craft is not practicable BOEM shall consult with the Naval History and Heritage Command regarding the development of an appropriate Historic Property Treatment Plan. Finally to address potential effects to sunken military craft during the Section 106 process please find attached draft language to be included in the project's PA. We are happy to discuss these stipulations or provide additional information if needed so please let us know.	
BOEM-2024-0001-0357-0068	Regarding determining which properties are adversely affected the Section 106 process is seriously flawed and misleading. First it relies on a very restrictive criteria to determine adverse effect which has not been used in prior DOI Section 106 processes that an order for a property to be adversely affected there must be a direct line of sight to the wind turbines. It thus ignores the contextual criteria that in fact the BOEM has used in the past which if used here would result in many more properties being adversely affected. Even by its own restrictive criteria it is not clear how it applies that criteria and why certain properties are not adversely affected. For example the turbines would be visible from the Barnegat Light lighthouse and a number of properties in the Beach Haven Historic district which are currently considered by BOEM not to be adversely affected. That	Thank you for your comment. There is ample precedent for DOI determining adverse effects on historic properties through the Section 106 process, pursuant to CFR § 800.5(a). This PEIS is not intended to comprehensively identify adversely affected historic properties, but to serve as a framework for such identification, assessment, and resolution of adverse effects as well as for Section 106 consultation for individual COPs in the NY Bight. The property-specific analysis will be conducted during the individual COP stage for each project within the NY Bight. Section 304 of the NHPA (54 U.S.C. 307103) grants federal agencies the authority to withhold from disclosure to the public information about the location, character, or ownership of a historic property, if the Secretary of the Interior determines that

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	incorrect determination could be affected by the fact that the Section 106 visibility consultant continues to present misleading information to the public regarding the frequency of the visibility of the wind turbines. Despite repeated comments by save LBI the consultant continues to refer to a meteorological report to support conclusions that the turbines will be rarely visible from shore. That report addresses the visibility of an undisclosed height object mostly from the Atlantic City airport over ground cover with entirely different meteorological conditions than what are occurring here. The results of that report and whatever is being looked at and whatever visibility measure is being discussed have absolutely no bearing on the visibility of 1000-foot-high wind turbines from the shore over the sea. The BOEM should cease presenting this misleading information to the public immediately. Finally the Section 106 process has not disclosed the presence of submerged prehistoric and Paleo-Indian sites and artifacts which are thought to be present in the lease area. It hides this information in a confidential Appendix. The BOEM must address that issue forthrightly. It can disclose whether such sites and artifacts have been identified through its vessel surveys without disclosing their exact location and present that data to the general public and the Native American tribes rather than restricting everything to a confidential status. This is a critical issue because once foundations are pile-driven into the seabed those sites and artifacts will be lost forever.	disclosure may risk harm to the historic property or impede the use of a traditional religious site by practitioners. BOEM requires lessees to provide public summaries of archaeological reports that can be shared with the public. Avoidance and/or minimization measures to protect archaeological sites, or mitigation measures if avoidance is not feasible, will be developed through consultation during the specific review for each COP. BOEM also requires lessees to develop and implement post-review discovery and monitoring plans.
BOEM-2024-0001-0423-0033	Appendix I: National Historic Preservation Act Section 106 Appendix V to the draft Programmatic Agreement in Appendix I provides an example of the contents of a Memorandum of Understanding to resolve adverse impacts for offshore wind projects. Stipulation II.B.1. provides proposed minimization measures for the Visual Area of Potential Impact including the following conditions for approval of the COP:"a. [italicized: Lessee will use uniform WTG design speed height and rotor diameter to reduce visual contrast and decrease visual clutter.]b. [italicized: Lessee will use uniform spacing to decrease visual clutter..."]These constraints upon the Bluepoint Wind Project seem excessive compared to the marginal utility of these conditions especially given the location of the Bluepoint Wind Lease Area. A less visually disruptive configuration of	Thank you for this comment. The suggested stipulations in the template Memorandum of Agreement in Appendix V of the Draft Programmatic Agreement for the NY Bight are based on stipulations that were consulted upon and included in executed Memorandums of Agreement for other offshore wind projects. The origin of this language is based on consultation with the ACHP, Tribal Nations, State Historic Preservation Officers (SHPOs), and other consulting parties, and therefore expeditious to consider for future offshore wind development. The intent of this programmatic effort to include an example Memorandum of Agreement template is to circulate these possible stipulations early for timely consideration and constructive application or adaptation to each individual project.

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	a new wind farm (but still a new visible wind farm) will not reduce the degree of change to the historic character of a property. These requirements suffer from the "one size fits all" approach that is endemic throughout the Draft PEIS. Section 106 impact mitigation is especially ill-suited for this methodology of applying one prescriptive program to all projects. Section 106 analysis and action must be guided by careful consideration of historic and culturally significant properties and which projects will and will not have impacts on those properties. After that consideration an equally careful program for addressing such impacts should be developed in a thoughtful manner. For example projects that are farther from shore and will have visual impacts that range from zero to de minimis can and should not mitigate for non- existent impacts and projects that have more significant visual impacts should be subject to a customized and carefully shaped mitigation program that allows for full clean energy development while mitigating any impacts to such properties if any.	
BOEM-2024-0001-0436-0021	NHPA Programmatic Agreement During the scoping process BOEM recognized that this PEIS provides an opportunity for National Historic Preservation Act consultation to update and improve the current NHPA Programmatic Agreement for the New York Bight. This remains a valuable and attainable goal but it will require effective coordination with State Historic Preservation Officers (SHPOs) Tribal Historic Preservation Officers (THPOs) and lease holders on the timeframe of development of the Final PEIS. A revised Programmatic Agreement should provide an appropriate level of specificity based on experience with Section 106 issues in the offshore wind development context and be open for signature with the release of the Final PEIS. Such an improved Programmatic Agreement should be executed by BOEM and consulting parties at the time of BOEM's ROD.	This comment acknowledges consultation being conducted by BOEM with SHPOs, Tribal Historic Preservation Officers (THPOs), and others and asserts that the Section 106 Programmatic Agreement should be executed prior BOEM's issuance of the NEPA ROD. BOEM intends to execute the Programmatic Agreement for the NY Bight in advance of the ROD. BOEM has been engaged with Tribal Nations, THPOs, SHPOs, and ACHP for more than 2 years while drafting this Programmatic Agreement. The level of specificity requested in the comment will be analyzed during the individual COP Section 106 consultations.
BOEM-2024-0001-0528ff	We assert that it should be mandatory that Tribal cultural monitoring be mandatory both offshore and onshore. We believe it should be mandatory that Tribal participation be involved in permitting and leasing of the of the lands of our submerged lands.	BOEM supports Tribal monitors and has encouraged this participation through past Memorandums of Agreement. PSO training has not always explicitly been in previous Memorandums of Agreement because these memorandums are typically broad to fill Tribal needs, though PSO training would fall under Memorandums of Agreement.

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		Additionally, the NY Bight Programmatic Agreement for compliance with Section 106 of the NHPA outlines the procedures that will be followed for the identification of historic properties and the assessment of adverse effects for both marine and terrestrial archaeological resources. As stipulated in the Programmatic Agreement, lessees are to coordinate with Tribal Nations early in the planning and design process, prior to historic property investigations or surveys, to coordinate survey planning and sharing of information related to sites of religious and cultural significance to Tribal Nations.

P.5.15 Demographics, Employment, and Economics

Table P.5-15. Responses to Comments on Demographics, Employment, and Economics

Comment No.	Comment	Response
BOEM-2024-0001-0063-0006	Economic Viability and Cost Concerns: Critics raise concerns about the economic viability of offshore wind projects pointing to the high costs of implementation and the potential burden on consumers especially with government subsidies.	Thank you for your comment. Refer to response to comment BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0071-0004	Millions of jobs and lives are at stake here for the sake of a few temporary jobs filled by out of state workers with the intentions of a greener world. From the commercial fishermen to plant workers truck drivers fish mongers restaurants etc the list goes on. This isn't just an industry it's our heritage and our history.	Thank you for your comment. Previously, lessees have entered into agreements to provide job training so that residents near these communities can benefit from the job creation. Turbine technicians, for example, are skilled jobs that are not temporary. Jobs that rely on tourism have been evaluated near an existing offshore wind project (Block Island), and it was found that there was no negative impact in that area, where the project is significantly closer to shore than the ones in this PEIS.
BOEM-2024-0001-0171-0002	[Underline: Jobs & Economy]-Transitioning to a clean energy future isn't just a win for the environment it's a win for local businesses the many union members who will be put to work and to New Jersey's overall economy.-The cost of wind energy is stable. Wind is free so the cost of energy is consistent once wind energy installations are built. In contrast fossil fuels are subject to volatile price swings and global events that create unwelcome surprises on energy bills.-Wind energy boosts U.S. economic growth and creates local union jobs. As wind energy grows so do the positive economic impacts. In 2021	Thank you for your comment.

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	new wind projects added $20 billion to the country's economy. Wind turbine technician is the fastest growing job in the U.S. and is projected to grow by 44% in the next decade.-Wind energy supports local communities. Wind can power our homes and our way of life. Wind provides a stable source of tax revenue delivering [Underline: an estimated $1.9 billion] [Hyperlink: https://cleanpower.org/facts/wind-power/] in state and local tax payments and land-lease payments every year. This is extra revenue that communities can put towards schools reducing tax-burdens for homeowners and boosting local infrastructure projects.	
BOEM-2024-0001-0313-0014	Consistent with ORECRFP22-1 and promoting the intent of the New York Buy American Act the solicitation sets a minimum U.S. iron and steel purchase requirement for all projects awarded to encourage domestic steel production and requiring developers to provide opportunities for U.S.- based steel suppliers to participate in the growing offshore wind industry.	Thank you for your comment.
BOEM-2024-0001-0313-0052	3.6.3.5 Impacts of Alternative C (Proposed Action) Adoption of AMMM Measures Demographics Employment and Economics Comment Upon review of the economic impacts analyzed there is surprisingly no analysis whatsoever about the direct impact to ratepayers as a result of the proposed action. While it is important to quantify economic impacts to commercial fisheries the concern that will impact all of our residents and is of serious concern to taxpayers is what is the economic impact to the fee and rate structure to a homeowner? While it is understandable that there are a number of variable factors quantification with explanation of ranges should be provided as local taxpayers should not be forced to encumber the cost of regional and global problems especially not without full and transparent disclosure in the section on economic impacts.	Refer to response to comment BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0314-0001	I am opposed to the development of off-shore wind farms off the coast of New Jersey. This is an issue that should be voted on by the citizens of New Jersey. Several critical issues including the cost of maintenance lifespan of turbines cybersecurity and the security of undersea cables for these wind farms must be addressed. The cost of maintaining offshore wind turbines could potentially add significant financial burdens to New Jersey citizens and businesses that rely on power in the state. Given the harsh marine environment these	Wind turbines are designed to withstand hurricanes, and new technologies are being tested in areas that are most susceptible to strong hurricanes. See also response to comment BOEM-2024-0001-0357-0059.

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	turbines require regular expensive maintenance to prevent corrosion mechanical failures and other issues. There is also the consideration of potential damage due to hurricanes. The substantial maintenance costs are very likely to lead to higher electricity costs for New Jersey residents. It is also impossible to forget that in the previous attempt at wind farms the New Jersey Senate and Legislature voted to give over 1 billion to Orsted that was supposed to go to NJ taxpayers to help with energy rates.https://www.insuranceinsider.com/article/2bm55t8cub6fynl009qtc/global-insurers-section/average-offshore-wind-loss-increased-sevenfold-2012-2021-gcubehttps://upcommons.upc.edu/bitstream/handle/2117/329731/master-thesis-xavier-turc-castell-.pdf#page31https://santiemidwest.com/blog/10-top-lubrication-challenges-in-wind-turbines/https://www.nrel.gov/wind/offshore-supply-chain-road-map.html	
BOEM-2024-0001-0322-0002	Offshore wind holds the promise of improved sustainability new jobs and increased economic activity. We look forward to working with BOEM to advance these goals while ensuring navigation safety which must remain paramount as wind energy development proceeds. Thank you again for the opportunity to comment. I would be pleased to provide additional comments or further information as needed.	Thank you for your comment.
BOEM-2024-0001-0331-0028	PEIS Section 3.63 Demographic Employment and Economics Lacks Critical Information and Mitigation In Section 3.63 Demographic Employment and Economics BOEM claims that this section includes a discussion of the analysis area and the potential impacts from the Proposed Action alternatives and ongoing and planned activities. There is a reference to Appendix B Supplemental Information and Additional Figures and Tables for detailed demographic housing and employment information. Where is the discussion of the impacts? This document serves no purpose in identifying the offshore wind impacts to the New Jersey economy along with cost impact of offshore wind projects to ratepayers. Without this analysis the ratepayers/residents businesses will not have a clear understanding of the impact to their energy bills and any cost/ benefit analysis will be incomplete.	Thank you for your comment. BOEM understands that this PEIS does not provide the specificity the commenter needs to understand the impacts on their energy rates or businesses. This PEIS provides an overview of the entire potential impact area and the types of impacts that may occur. In a project-specific COP NEPA analysis, those specific analyses can be conducted once project size, scope, and location are defined. Those NEPA documents will be available for public comment as well. See also response to comment BOEM-2024-0001-0357-0059.

Comment No.	Comment	Response
BOEM-2024-0001-0331-0029	In determining the number of jobs gained or lost due to the projects the lack of any analysis concerning lost jobs in the commercial and industrial businesses due to higher energy costs results in an incomplete and misrepresented cost/benefit analysis. In addition higher energy costs impacting our government municipalities counties and school districts which will be passed onto taxpayers should be included. The lost jobs in the current fossil fuel energy industries including but limited to South Jersey Gas headquarters in Atlantic City should be included. Offshore wind companies and BOEM's EI analysis is misleading as it only includes jobs gained and ignores jobs lost. Both positive and negative impact to jobs and impact to costs for ratepayers and taxpayers must be included in future COPs and DEIS documents. Lastly any payments made from taxpayer money to fund offshore wind facilities wind ports etc. must be included in the economic analysis as an offset to job numbers or economic impact as these payments are transfer payments from taxpayers used to "buy" jobs and fund the offshore wind economy. Without these adjustments to the usual Wind Developers and BOEM's calculations of economic impact their conclusions will be misleading and highly inaccurate.	Refer to responses to comments BOEM-2024-0001-0331-0028 and BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0331-0032	What are the risks of building an energy system such as offshore wind that is dependent on weather when BOEM outlines in the PEIS that weather events will continue to be more severe and catastrophic. BOEM claims that the PEIS is a more holistic approach to determining the impacts of offshore wind. The wind developers and BOEM include standard statements about the purpose and need for the offshore wind projects to achieve climate goals. But without including the determination of impacts and mitigation of offshore wind intermittency grid reliability and weather dependent energy in the environmental impact studies the studies are incomplete and misleading. The PEIS Does not Adequately Address Hurricane Impact and as Result BOEM is Exposing Taxpayers and Rate Payers to a Huge Financial Risk The PEIS includes one paragraph (Vol 1page 2-22) regarding hurricanes and storms and fails to offer any mitigation measures of how energy would be restored. NJBPU in its 2/14/24 Memorandum Docket No. QO24010008 addresses their concerns over hurricane impact to the viability of wind energy off the east	Thank you for your comment. BOEM does acknowledge that severe weather events have increased in frequency. A benefit realized by wind energy is that it reduces the need for fossil fuels that are one cause of climate change and these weather events. Turbines are built to withstand storms and, as the commenter points out, studies and improved technologies to secure them during hurricanes continue to be developed. BOEM does require developers to use the best practices available. Refer to response to comment BOEM-2024-0001-0357-0059 concerning energy supplies and rates. The PEIS does not address energy supply or the restoration of power. This issue must be addressed by individual power suppliers, and it is not within the scope of this analysis.

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	coast. Per their memo they state "Atlantic hurricanes pose a significant potential threat to the State's burgeoning OSW sector. Despite this risk relatively little technical research has been devoted to quantifying and assessing Atlantic hurricane impact upon OSW projects. As a result regulators developers and insurers have limited tools at their disposal to mitigate this risk or ascertain whether the risk warrants design modifications. The prevailing uncertainty surrounding what is widely perceived as a substantial threat to OSW largely without scientific or engineering backing serves as a considerable obstacle to the development of OSW. Development of advanced technical research quantifying and assessing hurricane risk is therefore necessary to aid developers regulators and insurers in mitigating hurricane risk and providing improved design standard baselines." The NJBPU is working with NOWRDC to prepare an in-depth analysis of the hurricane threat and the study will only begin on March 1 2024 and conclusions are expected to be completed by February 2026. This timeline and lack of knowledge puts ratepayers and taxpayers at great risk since investment of taxpayer and rate payers money continues without sufficient knowledge of hurricane impact on offshore wind energy. As decommissioning funding policy becomes more lax and private insurance coverage seems more costly and less likely taxpayers and rate payers will be footing the bill for damages.	
BOEM-2024-0001-0331-0033	The PEIS does address the risk of sabotage and the socioeconomic disruption that would follow it. In today's world the threat of sabotage to offshore wind projects is real (witness the sabotage of the Nord stream pipeline). Because of their locations the turbines are easily accessible. While the structures are robust and separated the transmission stations and transmission corridors where the power from many turbines comes together would be the more likely targets. One or two hits could knock out many megawatts of power. The structures and rotating blades produce radar clutter which can make it difficult to detect intruders on the surface. Subsurface activities would be expected and difficult to detect due to the underwater vibration noise from the turbines and transformers. The PEIS should provide an assessment of the risk and potential mitigation. It should show consultation with the DOD and preventive	Thank you for the comment. BOEM does consult with federal agencies, including the Department of Defense, at the lease sale stage to ensure proposed activities do not interfere with national security. Further, just as national security has included assurances for other offshore industries such as oil and gas, offshore wind security is addressed by other tools outside of this NEPA document and outside of BOEM’s jurisdiction.

Comment No.	Comment	Response
	measures. It should include consultation with the BPU and electric utilities and show how back up power will be provided. While the PEIS process need not spell out the details of the security plan it should include consultation with law enforcement to ensure an effective response plan is put in place by the operator if an incident occurs. A comment along those lines should be included in the PEIS to assure the public that appropriate precautions have been taken and a specific judgment made by BOEM on the acceptability of the risk and the impact on system reliability. Such plans are routinely required of nuclear projects with specific threat levels assessed addressed and tested such as the Aircraft Impact Rule.	
BOEM-2024-0001-0334-0014	By now you should be wondering if you aren't simply wasting your time. Perhaps feed that concern back up the chain of command. It can be expected that the whole offshore wind debacle is going to be called into question this year. - Is any of this actually fiscally attractive? The numerous wind build cancellations seems to indicate it is not. Investors are beginning to shy away from offshore wind and redeploy their money elsewhere.	Thank you for your comment.
BOEM-2024-0001-0345-0011	CCE also thanks BOEM for evaluating not only the potential adverse environmental impacts, but also the potential benefits including… local job benefits and more.	Refer to response to comment BOEM-2024-0001-0071-0004.
BOEM-2024-0001-0355-0003	With the proposed OSW projects I see a whole list of negatives and no positives at all. The list of negatives include: • Increase in utility costs by at least 2 - 3 times.	Refer to response to comment BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0355-0005	With the proposed OSW projects I see a whole list of negatives and no positives at all. The list of negatives include: - Increase in tax rates to pay for their construction and maintenance.	Refer to response to comment BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0355-0009	With the proposed OSW projects I see a whole list of negatives and no positives at all. The list of negatives include: • Major decrease in property values.	BOEM has added to Final PEIS Section 3.6.3.4.1 an analysis of the impacts of the NY Bight projects on property values, citing recent studies. BOEM has not found any evidence that offshore wind projects located as far offshore as the NY Bight projects would have any impact on property values.
BOEM-2024-0001-0357-0011	Neither this draft program EIS or any project specific EIS provides an assessment of the cumulative socioeconomic impact on the region	Refer to response to comment BOEM-2024-0001-0357-0059.

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	from the increased residential commercial and industrial electric rates from all of the projects (see Enclosure VIII).	
BOEM-2024-0001-0357-0059	Electric Rates-Cumulative Impact Electric cost: offshore wind is an expensive energy source but the Interior Department provides no analysis of the economic cost of the program from electric rate increases to residents and businesses. As shown in the chart below the full project for 5300 megawatts Atlantic Shores project off New jersey maturing in 2033 requires exorbitant increases in State-wide electric bills to be economically viable 20 25 and 30 percent for residential commercial and industrial users respectively (Source: Impact of New Jersey Offshore Wind Program on State Electric Rates Edward. P O'Donnell White Strand Consulting LLC November 2023). Those increases grow substantially as more wind projects enter the generation mix. SEE ORIGINAL COMMENT FOR GRAPH: Figure 5-Percentages NJ Electric Rate Increase Due to Offshore Wind The socioeconomic effects of such electric rate increases on households should be assessed. In particular the impact of reduced revenues and lost jobs in the commercial and industrial sectors should be assessed in any programmatic EIS.	The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state's offshore wind procurement laws and regulations. The electric distribution companies that acquire the power from the projects will distribute and sell the power to their customers. While the offtake agreements may influence the electricity prices paid by ratepayers in the states where the power is purchased, the exact cost cannot be known at this time, as electricity rates are affected by myriad factors, including current demand for electricity, the mix and price of other generation sources (e.g., other offshore wind projects, natural-gas power plants), and other factors, including natural events like high summertime temperatures. In electricity markets where wind power is generated, the electricity cost for ratepayers may be variable, such as when the market is saturated with electricity due to windy seasons, or conversely, when there is less wind and the power demand may be higher, causing rates to increase. COP-specific NEPA documents will be better able to conduct analyses concerning costs and rates when projects are defined and power purchase agreements are in place.
BOEM-2024-0001-0362-0001	Offshore wind is a vital clean energy solution that presents a once-in-a-generation opportunity to advance this mission if projects are developed in an equitable and environmentally responsible manner with high-road labor standards and attention to environmental justice. Offshore wind projects have the potential to lift up the working class with family-sustaining union jobs deliver benefits to communities hardest hit by climate change and economic inequality and protect wildlife and critical habitats at every stage of development.	Thank you for your comment.
BOEM-2024-0001-0362-0002	We appreciate BOEM's draft PEIS analyzing the potential impacts of offshore wind energy development in the six leased areas in the New York Bight. The final sale notice for these lease areas included lease stipulations designed to promote the development of a robust	Thank you for your comment.

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	domestic supply chain advance flexibility in transmission planning and create good paying union jobs. The leases require winning bidders to make efforts to enter into project labor agreements (PLAs); and require engagement with Tribes underserved communities ocean users and agencies. The lease stipulations also incentivize the use of domestically sourced components and require developers to create plans for contributing to the creation of a robust domestic supply chain. While BGA continues to urge BOEM to include more robust stipulations and bidding credits in its future leases these requirements and incentives properly implemented will help ensure that projects: • Maximize the creation of quality high-paying union jobs over projects' lifetime; • Expand U.S. manufacturing along robust domestic regional and local supply chains; • Deliver community benefits with attention to improving access to disadvantaged communities;	
BOEM-2024-0001-0362-0005	We support BOEM's intent to use the PEIS as an opportunity to analyze the potential impacts of offshore development in the region including environmental and socioeconomic impacts. This should include the potential beneficial climate job creation job quality and community impacts of development in these lease areas as well as impacts to the regional supply chain. The future individual project environmental impact statements (EISs) should contain more detailed and project specific environmental and socioeconomic analysis. The PEIS can be beneficial in analyzing the impacts on a regional scale but should not undermine the gravity of BOEM's environmental and socioeconomic priorities or developers' accountability for upholding them.	BOEM agrees with the commenter that project-specific NEPA documents will contain environmental and socioeconomic analyses that will provide additional assurances that BOEM is holding developers accountable for these priorities.
BOEM-2024-0001-0362-0006	The draft PEIS includes important analysis of employment demographics environmental justice and environmental mitigation. However there are ways the final PEIS can be strengthened through a deeper analysis of these topics. In the following sections we make several recommendations for preparing the final PEIS. To summarize we strongly urge BOEM to provide details related to creating high-quality union jobs; training and employment benefits; domestic	BOEM has provided lease incentives for developers to maximize the creation of quality high-paying union jobs; expand U.S. manufacturing along domestic, regional, and local supply chains; and deliver community benefits with attention to disadvantaged communities. Each developer will develop its specific plan as part of its COP, which will be reviewed by BOEM and will be a part of each project's project-specific NEPA analysis.

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	supply chains; ensuring environmental justice; and environmental protection.	
BOEM-2024-0001-0362-0007	We appreciate BOEM including an analysis of socioeconomic benefits in the PEIS. As part of the NEPA process BOEM is required to review environmental social and economic data related to the proposed project. In NEPA Congress declared: "It is the continuing policy of the Federal Government...to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social economic and other requirements of present and future generations of Americans."	Thank you for your comment.
BOEM-2024-0001-0362-0008	We believe that this depth of assessment is aligned with NEPA guidance. BOEM's July 2017 study "Evaluating Benefits of Offshore Wind Energy Projects in NEPA" states: "NEPA analyses (Environmental Assessments [EAs] or Environmental Impact Statements [EISs]) typically focus on adverse impacts to the environment. However NEPA analyses also need to include environmental and socioeconomic benefits analyses." [Footnote i: U.S. Department of Interior Evaluating Benefits of Offshore Wind Energy Projects in NEPA. July 2017.https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/Final-Version-Offshore-Benefits-White-Paper.pdf] The study also states that benefits analysis should consider electricity system benefits including injecting power into the existing grid; average retail cost of power; evaluating system benefits from offshore wind energy production; environmental benefits over key periods of a projects life-cycle including water wetlands biological and cultural resources recreation and tourism fisheries safety soils land use air quality noise and raw materials used for construction; and socioeconomic considerations. The study describes that although NEPA does not specifically require a socioeconomic assessment it does require an integrated use of the social sciences to assess impacts on the human environment. These requirements paired with President Biden's commitments to union labor environmental justice and the protection of natural resources should result in a thorough analysis that ensures communities workers and Tribes realize project benefits while protecting communities wildlife and the environment from	Thank you for your comment.

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	adverse impacts. Given this scope we urge BOEM to consider the following recommendations to fully evaluate environmental and socioeconomic impacts in the PEIS.	
BOEM-2024-0001-0362-0009	To create these conditions it is imperative that BOEM plays a role in ensuring that the positive impacts of offshore wind projects are maximized and delivered equitably while using the best available science and data to establish measures to avoid minimize mitigate and monitor environmental and wildlife impacts as well as their social implications. This will require that all offshore wind lease contracts and permitting activities ensure the application of high-road employment practices community benefits agreements (CBAs) best management practices and other means to ensure that projects are developed in an environmentally responsible manner and that benefits are maximized and equitable distributed.	Thank you for your comment. Refer to response to comment BOEM-2024-0001-0362-0014. In addition, AMMM measure EJ-1a (previously part of EJ-1 in the Draft PEIS) requires a communications plan and RP EJ-2 encourages an Environmental Justice Impact Mitigation Plan to minimize potential community impacts over the life of a project and to inform communities how lessees plan to communicate employment and other opportunities. The commenter also asks that BOEM make assurances about employment and community benefits through community benefits agreements. It must be noted that BOEM does not have jurisdiction to make those assurances. Community benefits agreements are negotiated between industry and local officials; BOEM is not involved.
BOEM-2024-0001-0362-0010	Creating accessible high-quality union jobs. The PEIS should analyze and provide information related to potential job creation including direct indirect and induced jobs from development in the lease areas. Furthermore BOEM should analyze not only anticipated job creation but the potential job quality impacts and benefits associated with this development. The U.S. Department of Labor (DOL)'s Good Jobs Initiative highlights equity and job quality principles and metrics that should be strongly considered by BOEM for use in the PEIS and future EISs. The equity and job quality principles include proactively addressing racial equity; reducing barriers to opportunity; supporting the creation of good-paying jobs with the free and fair choice to join a union; providing opportunities for all workers including underrepresented workers to be trained and placed in good-paying jobs; utilization of PLAs and/or local hire provisions training and placement programs for underrepresented workers; and adopting an equity and inclusion program/plan focused on procurement material sourcing construction inspection and hiring. [Footnote ii: U.S. Department of Labor (DOL) Previous Bipartisan Infrastructure Law (BIL) grants with focus on equity and job quality. https://www.dol.gov/general/good-jobs/making-good-jobs-through-federal-investments] These are great examples of	Refer to responses to comments BOEM-2024-0001-0362-0006 and BOEM-2024-0001-0362-0020.

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	metrics related to equity and job quality and should be considered for evaluating the job creation benefits of offshore wind development and should inform future BOEM review of project-specific construction and operations plans.	
BOEM-2024-0001-0362-0011	The draft PEIS includes the following information related to potential economic impacts: • Overall size of the projects: full development of leases has potential to create 5.6-7 GW of offshore wind energy. • BOEM estimates development of the six projects to total 1103 turbines 22 offshore substations and thousands of miles of cable. • The counties in New York and New Jersey most likely to experience economic impacts. • The ports with potential to support construction installation and decommissioning; and • The potential impacts to the commercial fishing and recreation and tourism industries. The PEIS would benefit from analysis of potential job creation and job quality impacts of development in the region as well as workforce development needs. Specifically the PEIS should provide an assessment of the following categories related to job creation job quality and job training:	Thank you for your comment. Refer to response to comment BOEM-2024-0001-0362-0013.
BOEM-2024-0001-0362-0012	Manufacturing. Maximizing the creation of manufacturing jobs across a domestic offshore wind supply chain is key for this industry to fulfill its economic benefit potential. Supply chain constraints caused by global bottlenecks are one of the greatest risks for achieving 30 GW of offshore wind by 2030. [Footnote iii: National Renewable Energy Laboratory (NREL) The Demand for a Domestic Offshore Wind Energy Supply Chain January 2022. https://www.nrel.gov/docs/fy22osti/81602.pdf.] According to the National Renewable Energy Laboratory (NREL) the average and maximum job creation utilizing 25% domestic content versus 100% domestic content in offshore wind projects results in a difference of approximately 30000- 40000 jobs from 2023-2030. The PEIS and future EIS should analyze the potential for projects to source domestically manufactured components. The PEIS should specify job categories as well as associated potential direct indirect and induced	Refer to response to comment BOEM-2024-0001-0362-0013.

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	jobs; gross state product; and anticipated personal income anticipated from the development. The analysis should also include an assessment of education and certifications necessary to access each job category; the training average wages hours career advancement physical demands and safety information; as well as any commitments developers have made or secured from suppliers to ensure workers have the free and fair choice to join a union such as through a union neutrality agreement. This information is essential for the U.S. workforce to have equitable access to employment opportunities. The PEIS should also include information about the material quality standards and certifications needed to secure a supplier contract with an offshore wind developer in the region. This information is critical for U.S. companies to access opportunities especially minority women and veteran owned businesses. Finally the PEIS and future EIS should contain information about the offshore wind energy components that will be manufactured outside the United States in order to understand the full potential of employment benefits from a mature domestic offshore wind supply chain.	
BOEM-2024-0001-0362-0013	Operations and Maintenance (O&M). Similarly for O&M job impacts the assessment should specify O&M job categories anticipated job numbers in each category and associated potential direct indirect and induced jobs; gross state product; and anticipated personal income. It should also include an assessment of education and certifications necessary to access those jobs; training average wages career advancement hours physical demands and safety information; as well as any commitments developers have made or secured from suppliers to ensure workers have the free and fair choice to join a union such as through a union neutrality agreement. The PEIS should also indicate the number of jobs that if any require specialized experience that would prohibit workers in the United States from accessing those jobs and the specific experience and training that is required. When it comes to training the assessment should specify whether workers will need to go overseas to receive training and the duration of that training. The PEIS should specify jobs categories related to the operation and maintenance of every aspect of	BOEM has provided lease incentives for developers to maximize the creation of quality high-paying union jobs; expand U.S. manufacturing along domestic, regional, and local supply chains; and deliver community benefits with attention to disadvantaged communities (87 *Federal Register* 2446). Each developer will develop its specific plan as part of its COP, which will be reviewed by BOEM and will be a part of each project's project-specific NEPA analysis and COP approval process.

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	offshore wind development including the turbines cables and onshore and offshore substations.	
BOEM-2024-0001-0362-0014	Construction. This PEIS and future EIS should assess potential construction jobs associated with development in the lease areas including any construction jobs anticipated to prepare ports for assembly preparation of cable routes and interconnections and the construction or site preparation of any manufacturing facilities. Consistent with the previous two categories BOEM should specify job categories job numbers in each category and potential direct indirect and induced jobs; gross state product; and anticipated personal income. The PEIS should also include an assessment of education and certifications necessary to access each job category and training average wages hours career advancement physical demands and safety information. If any construction jobs require specialized experience that prohibit workers in the United States from accessing these jobs that should also be detailed including the number of jobs as well as the training and experience required. The PEIS should also specify whether workers will need to go overseas to receive training and the duration of that training. The PEIS should include a discussion of how PLAs and Community Workforce Agreements (CWAs) will help ensure job quality and community benefits in the region. The PEIS should also include the status of PLAs or CWAs associated with the projects in the region. A PLA is an instrument to predict and control project timelines and labor costs. A PLA establishes the terms and conditions of employment of workers on specific construction projects including wages hours working conditions and dispute resolution methods. These agreements can be utilized at the state and local level to ensure high-road labor standards and timely project completion. PLAs promote safe quality cost-effective project delivery by providing project owners with unique access to the safest most productive best-trained skilled craft labor available in any given market. They can also help to ensure equitable access to jobs by including diversity equity and inclusion and local hire provisions. CWAs can go a step further on diversity equity and inclusion and are negotiated with both unions and community partners. According to the AFL-CIO CWAs "go well beyond the traditional experience and use of PLAs to explicitly	Thank you for your comment. Project labor agreements and CWAs are project-specific and have not yet been created for the projects covered by this PEIS. BOEM has provided lease incentives for developers to maximize the creation of quality high-paying union jobs; expand U.S. manufacturing along domestic, regional, and local supply chains; and deliver community benefits with attention to disadvantaged communities (87 *Federal Register* 2446). Per the lease, the lessee must make every reasonable effort to enter a project labor agreement covering the construction stage of the proposed project. Also refer to response to comment BOEM-2024-0001-0362-0034.

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	address the legitimate needs and interests of urban communities that have historically been excluded from the benefits of economic development." CWAs frequently include local hire provisions targeted hire of low-income or disadvantaged workers and the creation of pre-apprenticeship pathways. Registered apprenticeship utilization should also be documented including the types of apprenticeships to ensure that they are union programs or DOL-certified and the ratio of apprentices to journeymen in each program.	
BOEM-2024-0001-0362-0015	Training and Employment Benefits. BOEM should include an analysis of existing or potential developer strategies in the state or region for investing in workforce training programs to support offshore wind development and include detailed information regarding training in the PEIS and future EIS. Lessees should invest in training programs that are portable; accredited; have stackable credentials; include safety training standards and disaster response measures; and are industry recognized. BOEM should also analyze opportunities for developers to invest in programs that prioritize the training of Justice40 communities as well as disadvantaged and displaced workers and provide wrap-around support services to support their enrollment. Disadvantaged workers include workers dislocated from fossil-fuel jobs, workers of color, women, formerly incarcerated workers, workers who live in environmental justice communities, workers with disabilities, and veterans. Workforce training investments should provide the option to enter into a memorandum of understanding with community stakeholders unions and companies and other strategies to support recruitment retention interviews upon completion and successful placement of graduates in apprenticeships or internships. Lessees should consult with labor unions and community groups to ensure training investments result in increased equitable access to safe quality jobs that will also provide more efficient operations.	Thank you for the comment. In AMMM measure EJ-1a (previously part of EJ-1 in the Draft PEIS), lessees must provide an Environmental Justice Communications Plan that includes (among other requirements) when, how, and to whom employment opportunities are advertised and how the lessee plans to maximize access to those opportunities for low-income and minority populations, including but not limited to the communication and advertising for training programs and hiring processes. The Final Environmental Justice Communications Plan shall be submitted to BOEM within 90 calendar days of the ROD on a project-specific COP NEPA review.
BOEM-2024-0001-0362-0016	Many unions run high-quality registered workforce development programs that train participants in various trades that have transferable skills to the offshore wind industry. However for a U.S. workforce to access opportunities in offshore wind developers must share information about the specific skills training and certifications	Refer to response to comment BOEM-2024-0001-0362-0015.

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	required as well as information about employment opportunities. This information along with specific commitments to develop durable pathways for minority contractors and workers into training and employment is invaluable. Union-affiliated training registered apprenticeship and pre-apprenticeship programs many of which offer wrap-around services to support trainees through the programs are the premier mechanisms for building career pathways and help ensure that workers have a clear path towards skills advancement and career development. These programs can also help promote equity and fairness in the workplace by providing training and career advancement to individuals from underrepresented groups.	
BOEM-2024-0001-0362-0017	Pre-apprenticeship programs aim to ensure that workers can qualify for entry into an apprenticeship program and have the skills and support they need to succeed. These programs are generally designed to target certain populations or demographics such as low-income workers, workers of color, women, and other marginalized communities. Additionally many unions offer training throughout a member's career to enable them to stay up to date with changes in technology. The most successful pre-apprenticeship programs are those affiliated with registered apprenticeships or other contractually agreed on-the-job training programs. Apprenticeships are registered through a state apprenticeship agency or through the DOL. Registered apprenticeships are paid positions that combine on-the-job training with classroom instruction in a trade. Construction unions operate robust registered apprenticeship programs while industrial unions work with employers on joint labor management training programs that also provide a combination of classroom and on-the job skills training. When these programs are paired with recruitment strategies such as partnering with a community group to provide information about workforce and training opportunities and providing wrap-around services the benefits can be even greater. Many examples of programs providing such services can be found in the November 2022 workforce development White House fact sheet. [Footnote iv: The White House: FACT SHEET: President Biden Celebrates New Commitments toward Equitable Workforce Development for Infrastructure Jobs November 2 2022.	Refer to response to comment BOEM-2024-0001-0362-0015.

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	https://www.whitehouse.gov/briefing-room/statements-releases/2022/11/02/fact-sheet- president-biden-celebrates-new-commitments-toward-equitable-workforce-development-for-infrastructure-jobs/]	
BOEM-2024-0001-0362-0018	BOEM should also analyze language access needs for local communities to access jobs benefits and how to address the needs. Demographics such as language or education should be taken into account to ensure jobs and training are accessible to a diverse workforce. Any agreements that developers have made to increase access be it to jobs in manufacturing O&M construction or otherwise should be detailed to increase transparency and the local community's ability to access these resources and benefits.	Refer to response to comment BOEM-2024-0001-0362-0015. In addition, the Environmental Justice Communications Plan (AMMM measure EJ-1a [previously part of EJ-1 in the Draft PEIS]) must specifically target low-income and minority populations—and communities identified by applicable state-level environmental justice and related screening tools—and advance meaningful engagement based on each affected community's unique communication and information needs.
BOEM-2024-0001-0362-0020	For example CBAs are an important way to ensure that development projects provide real and meaningful community benefits. CBAs can be expansive in scope and are often negotiated with both union and community partners. Because they are legally-binding agreements they provide a higher level of accountability and enforceability and can therefore help ensure that specific workforce and community benefits are provided. CBAs can ensure that developers are held accountable for providing the benefits they promise and that community groups have a say in the development process. Local Hire provisions often included in CBAs are another important tool to support the hiring of workers from within the state or local community. Without this provision work crews from out of state can be brought in minimizing the job creation benefits for the local community. BOEM should analyze the benefits of requests made by local communities such as requests for CBAs or community governance of offshore wind projects.	Thank you for the comment. BOEM agrees that enforceable community benefits agreements are powerful tools communities can use to influence the partnership with offshore industries to create opportunities in affected communities. However, BOEM is not a party to those agreements. In addition, lessees can include information on community benefits agreements in their COPs as evidence of their actions to mitigate potential impacts in local communities.
BOEM-2024-0001-0362-0030	Utilizing Domestic Content Maximizes Benefits and Supports National Security. It is evident that utilization of domestic content in offshore wind projects is imperative for reaching our federal goals. The March 2022 offshore wind energy supply chain report by the NREL states that supply chain constraints caused by global bottlenecks are one of the greatest risks for achieving our national offshore wind goals. [Footnote xi: NREL The Demand for a Domestic Offshore Wind Energy Supply Chain January 2022. https://www.nrel.gov/docs/fy22osti/81602.pdf.] The modeling in the	Thank you for your comment. The Biden-Harris Administration signed a Memorandum of Understanding with nine East Coast states and four federal agencies on September 21, 2023 to expand America's offshore wind supply chain to benefit workers and communities, plan and build transmission infrastructure to connect projects to the grid, and advance innovation to reduce deployment barriers and lead on cutting-edge technologies. This Memorandum of Understanding was created to address the

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	report also shows that average and maximum job creation utilizing 25% domestic content versus 100% domestic content in offshore wind projects results in a difference of approximately 30000-40000 jobs from 2023-2030. [Footnote xii: Ibid.] In addition across renewables even a modest increase in manufacturing produces an additional 45000 good manufacturing jobs per year and an additional $5 billion in wages through the 2020s as the United States continues greening its electricity grid. [Footnote xiii: Princeton University Working Paper: Influence of High Road Labor Policies and Practices on Renewable Energy Costs Decarbonization Pathways and Labor Outcomes April 13 2021. https://netzeroamerica.princeton.edu/img/Working_Paper-High_Road_Labor_and_Renewable_Energy-PUBLIC_RELEASE-4-13-21.pdf] Further domestic content requirements are unlikely to influence wind power capital costs. [Footnote xiv: Ibid] And as emphasized in a number of President Biden's executive orders national security is also protected by utilizing domestic content.	concerns expressed in the comment. See also BOEM-2024-0001-0362-0034.
BOEM-2024-0001-0362-0033	Supporting U.S. manufacturing also has equity implications. Data shows that the decline in U.S. manufacturing has been devastating to the middle-class especially for Black and Hispanic workers and other workers of color who disproportionately do not hold college degrees and who experience discrimination limiting access to better-paying jobs. [Footnote xix: Economic Policy Institute (EPI) Botched policy responses to globalization have decimated manufacturing employment with often overlooked costs for Black Brown and other workers of color January 31 2022. https://files.epi.org/uploads/239189.pdf] Manufacturing wages are substantially larger than in non-manufacturing industries for median-wage non-college-educated employees with Black workers in manufacturing earning 17.9% more; Hispanic workers earning 17.8% more Asian American Pacific Islander (AAPI) earning 14.3% more; and white workers earning 29% more. [Footnote xx: Ibid.]	Thank you for your comment. The Biden-Harris Administration states that investments in the U.S. offshore wind industry have increased by $7.7 billion since 2022, and the number of companies looking to support this supply chain has risen 54% to 4,100 companies across all 50 states. With the AMMM measures included in this PEIS, BOEM anticipates that communities will have opportunities to realize supply chain and employment benefits at all income levels and by all socio-economic groups.
BOEM-2024-0001-0362-0034	Union Labor Benefits Workers and Projects. Across sectors the DOL reports that unions raise wages for all workers and the Bureau of Labor Statistics reports that non-union workers earn just 83% of what unionized workers earn. [Footnote xxi: DOL The Union Advantage. www.dol.gov/general/workcenter/union-advantage]	Thank you for the comment. BOEM is supporting the establishment of a durable domestic supply chain that can sustain the U.S. offshore wind industry and safe, expeditious, and orderly development in the OCS. To

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	[Footnote xxii: Bureau of Labor Statistics (BLS) Union Members 2021. www.bls.gov/news.release/pdf/union2.pdf] It's no wonder that union approval is at its highest since 1965 with 68% approving of labor unions and even higher numbers of support specifically among young people and people of color. [Footnote xxiii: The White House White House Task Force on Worker Organizing and Empowerment Report February 2022. www.whitehouse.gov/wp-content/uploads/2022/02/White-House-Task-Force-on-Worker-Organizing-and-Empowerment-Report.pdf] The White House report on "Worker Organizing and Empowerment" says that support for a union increases to 74% for workers aged 18 to 24 75% for Hispanic workers 80% for Black workers and 82% for Black women workers. [Footnote xxiv: xxiv ibid.] The report also contains guidance for how unions advance equity for underserved populations including greater transparency around pay and higher wages greater job security and increased access to career pathways for women and workers of color. [Footnote xxv: DOL How the Task Force is advancing equity across underserved communities by supporting worker organizing and collective bargaining. www.dol.gov/sites/dolgov/files/general/labortaskforce/docs/508_union-fs-1.pdf] PLAs are a proven way to ensure workers in the construction sector have access to the benefits and protections of unions.	advance this vision, BOEM has included the following three lease stipulations for the NY Bight area: • The first stipulation requires the lessee to establish a statement of goals in which the lessee will describe its plans for contributing to the creation of a robust and resilient U.S.-based offshore wind supply chain. The lessee must provide regular progress updates to BOEM, and BOEM will make these updates publicly available. • The second stipulation would incentivize the lessee to procure major offshore wind components domestically through operating fee credits. • Finally, BOEM has included a lease stipulation encouraging lessees to make every reasonable effort to enter into project labor agreements covering the construction stage of any project proposed for the leased area. Offshore wind projects are large, complex construction efforts and are well suited for project labor agreements.
BOEM-2024-0001-0362-0035	Moreover ensuring developers negotiate a PLA supports BOEM's proprietary interest in ensuring orderly and efficient operations. President Biden's Executive Order 14063 Use of Project Labor Agreements for Federal Construction Projects issued February 4 2022 underscores the benefits of utilizing PLAs for large-scale construction projects. "Project labor agreements provide structure and stability to large-scale construction projects[and] avoid labor-related disruptions by using dispute-resolution processes to resolve worksite disputes and by prohibiting work stoppages including strikes and lockouts. They secure the commitment of all stakeholders on a construction site that the Project will proceed efficiently without unnecessary interruptions." [Footnote xxvi: White House Executive Order on Use of Project Labor Agreements for Federal Construction Projects Feb. 4 2022.	Refer to response to comment BOEM-2024-0001-0362-0034.

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	https://www.whitehouse.gov/briefing-room/presidential-actions/2022/02/04/executive-order-on-use-of-project-labor-agreements-for-federal-construction-projects/] PLAs have been demonstrated to reduce project costs for developers save public funds in the long run and produce increased economic benefits for the local community. [Footnote xxvii: Illinois Economic Policy Institute (ILEPI) Efficiencies of Project Labor Agreements May 18 2015. https://illinoisepi.org/site/wp-content/themes/hollow/docs/wages-labor-standards/Illinois-PLAs-in-CDB-Projects-FINAL.pdf] In addition PLAs often lead to safer working conditions as a result of a more skilled workforce that union training programs provide. [Footnote xviii: Stockholm Environment Institute Calculating Maritime Shipping Emissions Per Traded Commodity April 2019. https://www.sei.org/publications/shipping-emissions-per-commodity/] A 2021 Canadian study found that unionization in institutional commercial and industrial construction maintenance and repair work was associated with a 25% lower lost-time injury rate 23% lower incidence of musculoskeletal lost-time injury claims and 16% lower incidence of critical lost time injury claims.[Footnote xxix: .iwh.on.ca/sites/iwh/files/iwh/reports/iwh_report_union_safety_effect_construction_update_2021.pdf] Data also suggests that accidents in the construction industry are more common in states with low-road contractors. [Footnote xxx: UC Berkeley Labor Center Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities May 2014. https://laborcenter.berkeley.edu/pdf/2014/WET-Plan-Appendices14.pdf] Union firms are also 16% less likely to report difficulty in filling open positions 13% less likely to fail in retaining skilled workers and 21% less likely to report project delays due to retention issues which is key to timely and efficient deployment during construction labor shortages. [Footnote xxiv: ibid.] Because PLAs often include provisions around apprenticeship utilization and recruitment of women minorities veterans and other underrepresented workers they also contribute to more equitable career pathways for a diverse workforce. These data points are important to consider as BOEM undergoes the NEPA review process.	

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BOEM-2024-0001-0421-0002	In addition to supporting cleaner healthier and more sustainable communities by transitioning off expensive fossil fuels these offshore wind projects would provide thousands of good-paying union jobs and bolster the region's economy. Our country urgently needs a massive build up of clean energy sources. My state of New Jersey has been a leader in supporting offshore wind energy. To maximize the supply chain port infrastructure and workforce investments we must continue developing a steady stream of clean sustainable offshore wind projects. To make this happen we must take whatever responsible steps we can to remove barriers to moving forward with these projects while protecting our marine ecosystem.	Thank you for your comment.
BOEM-2024-0001-0426-0003	From an economic perspective the following questions remain largely unanswered: What will offshore generation and transmission cost and how will it be funded?	Refer to response to comment BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0426-0005	What about the ability of developers to follow through on their financial commitments if projected returns do not materialize? Will developers have the funds to decommission when that time comes or will they plunge special purpose subsidiaries into bankruptcy leaving rate payers to clean up their mess?	Refer to response to comment BOEM-2024-0001-0357-0059.
BOEM-2024-0001-0433-0002	The potential lease areas in the NY/NJ Bight will help bring family-sustaining and union jobs directly to New Jerseyans. Offshore wind will be at a more stable cost to ratepayers as well since it is not subject to the volatile economic climate of the fossil fuel industry that creates unwelcome surprises on energy bills.	Thank you for your comment.
BOEM-2024-0001-0436-0008	Moreover as part of the No Action Alternative the Final PEIS must fully analyze the impacts of this assumed inaction in terms of not only avoided impacts but unrealized environmental benefits and socioeconomic gains as well.	Thank you for your comment. The No Action Alternative does consider impacts of not developing the six NY Bight offshore wind projects. See Section 3.6.4.4.3 of the PEIS.
BOEM-2024-0001-0441-0001	The offshore wind industry presents substantial economic opportunities for women entrepreneurs in New Jersey. As this sector continues to grow it creates a demand for various goods and services ranging from engineering and construction to maintenance and logistics. Women-owned businesses can tap into these supply chain opportunities providing services and products needed for offshore wind projects and increasing job opportunities for local communities.	Thank you for your comment.

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BOEM-2024-0001-0468-0002	Offshore wind projects in the New York Bight have the potential to create thousands of jobs and generate substantial economic activity. A study from Wood Mackenzie shows that building offshore wind projects in the New York Bight can support up to 25000 development and construction jobs from 2022 to 2030 as well as an additional 7000 jobs in communities supported by this development. The study also concludes the lease area also has the potential to support up to 4000 operations and maintenance jobs annually and approximately 2000 community jobs in the following years.	Thank you for your comment. BOEM has included the following information from that study in Final PEIS Section 6.3.4.3. Zhang et al. (2020) estimates that the jobs supported by all development in the NY Bight area are 100 annual development jobs (2022 – 2029) and 32,200 construction jobs (2025–2030). Determination of where those jobs may occur will depend on project locations.
BOEM-2024-0001-0468-0004	As the White House wrote in its Offshore Wind Fact Sheet: "The President recognizes that a thriving offshore wind industry will drive new jobs and economic opportunity up and down the Atlantic Coast in the Gulf of Mexico and in Pacific waters. The industry will also spawn new supply chains that stretch into America's heartland as illustrated by the 10000 tons of domestic steel that workers in Alabama and West Virginia are supplying to a Texas shipyard where Dominion Energy is building the Nation's first Jones Act compliant turbine installation vessel. "Federal leadership in close coordination with states and in partnership with the private sector unions and other key stakeholders is needed to catalyze the deployment of offshore wind at scale." ...the Administration is taking coordinated steps to support rapid offshore wind deployment and job creation: 1. Advance ambitious wind energy projects to create good-paying union jobs 2. Investing in American infrastructure to strengthen the domestic supply chain and deploy offshore wind energy 3. Supporting critical research and data-sharing. "We can and we must create a high-road offshore wind industry that maximizes the creation of quality family-sustaining jobs delivers community benefits expands domestic manufacturing and develops a robust local supply chain while also avoiding minimizing mitigating and monitoring environmental justice impacts and ensuring access to the benefits for low-income and Black Brown Indigenous and People of Color ("BIPOC")." As the National Environmental Policy Act ("NEPA") is intended to ensure large-scale development projects "foster and promote the general welfare to create and maintain conditions under which man and nature can exist in productive	Thank you for your comment.

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	harmony and fulfill the social economic and other requirements of present and future generations of Americans" union labor must be mobilized and expanded to ensure offshore wind jobs pay family-sustaining wages benefits have worker protections have advancement and career pathways and maximize job creation.	
BOEM-2024-0001-0470-0016	[Italics: a) The PEIS fails to fully assess the socioeconomic impacts of higher electric prices on Eastern States that already carry the economic burden of cleaner electricity assets]. As Table 8 demonstrates using carbon dioxide as an indicator even in 1970 (at the point when the modern CAA was first passed) the eastern seaboard states already had cleaner generation than counterparts in the Midwest and South. Since that time the eastern states have consistently invested in more clean generation especially hydro and nuclear to avoid using their finite and valuable airshed carrying capacity as a dumping ground for conventional pollutants and greenhouse gases. This advanced investment in green technology lead to positive outcomes but also created much higher electricity prices for businesses and residents (See Table 9). [See original attachment for Table 8: Per Capita Energy-related Carbon Dioxide Emissions* by State (19702021)][Bold: Source: U.S. Energy Information Administration State Energy Data System and EIA calculations made for this analysis. *Metric tons of energy-related carbon dioxide per resident][Table 9: States with Highest Electricity Rates (12/23)]State: Hawaii; Price per KWh (cents per hour): 41.60State: Rhode Island; Price per KWh (cents per hour): 30.88State: California; Price per KWh (cents per hour): 29.11State: Massachusetts; Price per KWh (cents per hour): 28.85State: Maine; Price per KWh (cents per hour): 28.04State: Connecticut; Price per KWh (cents per hour): 26.86State: New Hampshire; Price per KWh (cents per hour): 24.98State: Alaska; Price per KWh (cents per hour): 24.70State: New York; Price per KWh (cents per hour): 22.52State: Vermont; Price per KWh (cents per hour): 21.09State: Michigan; Price per KWh (cents per hour): 18.55State: DC; Price per KWh (cents per hour): 17.75State: New Jersey; Price per KWh (cents per hour): 17.59State: Pennsylvania; Price per KWh (cents per hour): 17.53State: Maryland; Price per KWh (cents per hour): 17.46State: Wisconsin; Price per KWh (cents per hour): 16.48State: Delaware;	Refer to response to comment BOEM-2024-0001-0357-0059.

Comment No.	Comment	Response
	Price per KWh (cents per hour): 16.32State: Ohio; Price per KWh (cents per hour): 15.69State: Nevada; Price per KWh (cents per hour): 15.55State: Florida; Price per KWh (cents per hour): 15.26[Table End][Bold: Source US EIA]	
BOEM-2024-0001-0470-0017	An unrecognized economic consequence of this disproportionate "greening" of Eastern Seaboard electricity (and other systems such as transportation) is the airshed subsidy provided to dirtier states by the clean coastal states. In effect the freed up eastern airshed assets are the earned return-on-investment (ROI) from the substantial clean energy investment over previous decades (with corollary increases in electricity costs). This airshed capacity has been expropriated by states whose continued dirty coal and natural gas plant emissions move into and use the airshed absorption capacity freed up by the multi-decade east coast clean investment. Said another way more westerly areas that continued burning coal were using the unacknowledged "emission credits" created by the eastern state utilities and ratepayers that transitioned their energy and cut emissions. The states that still had coal as their leading source of electricity in 2021 illustrates this wealth transfer (see Figure 2) . Greener coastal states downwind of brown states have effectively subsidized cheaper dirtier electricity production for decades. This wealth transfer is largely ignored by economists and the Governors of eastern clean states who continue to give away the hard-earned airshed ROI their residents paid for in their electric bills. This historic recapitalization underwritten by eastern state residents manifests in the already high price for electricity. As Table 9 shows of the twenty states with the highest electricity prices thirteen are (already) green eastern states. The current 6 cents per KWh for wholesale electricity in New Jersey will be affected by the NJBPU orders allowing OSW generators to receive payments averaging more than 15 cents per kilowatt. The full suite of socioeconomic impacts for unsegmented OSW system buildout including all the costs that fold into retail price increases are not analyzed in the PEIS (or by utility commissions and state leaders). In addition the PEIS must evaluate the socioeconomic costs of jobs losses business closure or relocation opportunity losses and other diminishment of economic development caused by high electricity prices. [Footnote 8: To illustrate this point the Biden	Refer to response to comment BOEM-2024-0001-0357-0059.

Comment No.	Comment	Response
	Administration is using federal funds to support a planned $20 billion Intel chip manufacturing complex in Ohio. This electricity-intensive industry is being sited in a state that gets over 50% or its electricity from natural gas 37% from coal and only 4% from renewables. The average retail price of electricity in Ohio is 10.64 cents/kWh when accounting for re- ductions to business.][See original attachment for Figure 2: Coal Remains Largest Source of Electricity Generation in 15 States] It makes no socioeconomic sense for any state with a clean generation portfolio to prematurely retire existing electricity assets while states with the highest GHG outputs per capita continue using coal generation.	
BOEM-2024-0001-0470-0018	[Italics: b) The PEIS fails to assess the full cost of needed storage and backup generation facilitates to meet forecast demand using portfolio-mandated generation assets] As noted above NYSERDA estimates that by 2040 NY will need about 12 GW of energy storage and over 17 GW by 2050 to integrate renewable generation while decarbonizing and maintaining grid reliability. To date New Jersey has planned for 2 GW of storage capacity. The socioeconomic impacts including land acquisition construction and operation costs as well as safety to surrounding communities inter alia of building and operating these battery and other storage facilities has not been assessed or disclosed in the PEIS.	Thank you for your comment. The storage needed and the land acquisition, construction, and operation costs cannot be disclosed for this PEIS. This project-specific information will be available for COP-specific NEPA analyses when project designs are available.
BOEM-2024-0001-0512-0002	The potential economic implications of these projects are also very alarming to me. The cost of electricity generated by these offshore wind farms is significantly higher than that of what we can get from conventional energy sources. Taxpayers should not be burdened with subsidizing in any way these projects that are potentially very detrimental to our communities especially when there are more cost-effective and environmentally sustainable alternatives available that do not have the potential to disrupt our valuable industries.	Refer to response to comment BOEM-2024-0001-0331-0032.
BOEM-2024-0001-0522-0001	I SUPPORT OFFSHORE WIND ENERGY DEVELOPMENT IN THE NEW YORK BIGHT FOR THE FOLLOWING THREE REASONS: 1. Jobs I support offshore wind development off the Jersey coast because a strong offshore wind industry will create thousands of well-paying union jobs. Transitioning to a clean energy future isn't just a win for the environment it's a win for local businesses the many union members who will be put to work and to New Jersey's overall economy. New	Thank you for your comment.

Comment No.	Comment	Response
	Jersey's highly trained workforce is ready to step up to the plate and deliver clean offshore wind to millions of families across our region. I commend BOEM for its efforts to support economic development so far and ask you to proceed quickly to ensure that New Jersey workers and communities see the benefits.	
BOEM-2024-0001-0528aa	The effects of the unnatural structures will force loss of generational commercial jobs for just a few temporary jobs. As somebody said before, there were 80,000 jobs. But there's 9 million people in New Jersey. What percentage is that? That's not really a lot.	Thank you for your comment. Previously, lessees have entered into agreements to provide job training so that residents near these communities can benefit from the job creation. Turbine technicians, for example, are skilled jobs that are not temporary. Jobs that rely on tourism have been evaluated near an existing offshore wind project (Block Island), and it was found that there was no negative impact in that area where the project is significantly closer to shore than the ones in this PEIS.
BOEM-2024-0001-0529u	I'd like to draw attention to Salem County, New Jersey, where there is a proposed built port currently in development. It is vital, component in the offshore wind vision that holds the key job creation, providing dedicated spaces for staging and assembly and manufacturing of the wind components.	Thank you for your comment. BOEM acknowledges the potential for the New Jersey Wind Port to support the NY Bight projects and analyzes this as a representative port in the Final PEIS.
BOEM-2024-0001-0529ff	and then also, what about the money for the rate and taxpayers that this is going to cost? Nobody is saying anything about that. They're saying that this is, you know, going help everyone in New Jersey, but they're not saying, everyone has to look these facts up. They're not saying anything about the money that it's going cost, the rate in taxpayers on their electric bills, and they will go up. It's a fact, but nobody's really looking into it.	Thank you for your comment. The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state’s offshore wind procurement laws and regulations.

P.5.16 Environmental Justice

Table P.5-16. Responses to Comments on Environmental Justice

Comment No.	Comment	Response
BOEM-2024-0001-0171-0003	[Underline: Health]-Production and combustion of fossil fuels releases dangerous pollutants into the air. These pollutants result in a wide range of health impacts including early death heart attacks respiratory disorders stroke and exacerbation of asthma. Communities of color often suffer a disproportionate burden of these health impacts due to systemic racism and historically living closer to power plants. Investing in offshore wind won't just fight climate change it will also help communities and urban residents breathe easier by lessening air pollution.-BOEM must act quickly to secure our clean energy future to protect the health of an entire generation of children.	Thank you for your comment. Air emissions are analyzed under each action alternative and include the potential benefits NY Bight projects may have on EJ communities.
BOEM-2024-0001-0313-0011	In addition to required Environmental Mitigation Plans Fisheries Mitigation Plans Stakeholder Engagement Plans and New York Workforce and Jobs Plans Proposers must demonstrate a detailed understanding of potential benefits and burdens to Disadvantaged Communities from their projects. This requirement aligns with the principles of a just transition outlined in the Climate Act.	BOEM agrees; COP-specific NEPA documents will provide site-specific analysis, which will include community characteristics at a more granular level. These NEPA documents will also be available for public comment. The COP-specific NEPA documents will assess potential benefits and impacts on communities with environmental justice concerns. Application of AMMM measure EJ-1a (previously part of EJ-1 in the Draft PEIS), the Environmental Justice Communications Plan, should address and communicate potential benefits and burdens.
BOEM-2024-0001-0362-0019	Ensuring Environmental Justice The draft PEIS includes the following information related to environmental justice: The counties where onshore infrastructure may be located the counties with representative ports that may be used by the NY Bight projects as well as the counties closest to the NY Bight lease areas that may be affected by construction and operation of the NY Bight projects. Factors that can impact communities including air emissions cable emplacement/maintenance lighting noise port utilization and presence of structures. Avoidance minimization mitigation and monitoring measures. The draft PEIS provides a good initial framework for analyzing environmental justice impacts from offshore wind development but more detailed and community	BOEM agrees that more detailed and community-specific analyses are needed as project planning progresses to ensure that there will not be disproportionate and adverse impacts. These analyses should be included in the COP-specific NEPA documents. For more information, see BOEM-2024-0001-0435-0048 and BOEM-2024-0001-0313-0011 comment responses. Application of AMMM measure EJ-1a (previously part of EJ-1 in the Draft PEIS), the Environmental Justice Communications Plan, could help minimize impacts. OSW projects are developed by private entities and are therefore not considered federal investments as referenced in Justice40. BOEM regularly evaluates whether any of its programs qualify as Justice40 programs under

Comment No.	Comment	Response
	specific analyses are needed as project planning progresses. Without known details for port transmission and turbine construction the specificity of the analysis is lacking. The Biden administration has made historic commitments to environmental justice including the goal for 40% of the overall benefits of federal investments to flow to disadvantaged communities. While benefits from offshore wind projects are not explicitly considered in Justice40 generally any federal program that addresses climate change clean energy and energy efficiency clean transit affordable and sustainable housing training and workforce development legacy pollution and clean water infrastructure is considered a J40 covered program. BOEM should analyze how development in the lease areas can ensure that communities and Tribes receive the maximum possible benefits.	guidance from the Office of Management and Budget, CEQ, and the National Climate Advisor.
BOEM-2024-0001-0362-0024	Pre-construction construction and post-construction monitoring should be conducted especially in areas of known vulnerability such as those adjacent to known sources of contaminants or near environmental justice communities.	BOEM acknowledges that the PEIS does not provide the specificity needed to determine whether there could be disproportionate and adverse cumulative impacts for potentially affected communities with environmental justice concerns (see Section 3.6.4.2, *Scope of the Environmental Justice Analysis*). The COP-specific NEPA documents should include baseline assessments of existing stressors/pollution burden in the proposed locations for the permit activities. BOEM appreciates the recommendation of implementing monitoring in proposed project locations to ensure there are not disproportionate and adverse impacts. AMMM measures EJ-1a (previously part of EJ-1 in the Draft PEIS) and EJ-3 are intended to provide an avenue for community members to identify impacts over the life of the projects, and for lessees to document their responses to concerns as they are raised. Note that EJ-2 has been revised to be an RP as an "Environmental Justice Impact Mitigation Resources Plan."
BOEM-2024-0001-0423-0015	Environmental Justice Ocean Wind has concerns about the approach BOEM is taking to environmental justice (EJ) impacts and AMMMs put forward in the Draft PEIS.[bold: EJ-1] would require a lessee to create an Environmental Justice Communications Plan.[bold: EJ-2] would require as part of the COP submission of an Environmental Justice Community Mitigation Resources Plan (EJ Plan) for providing households in EJ populations that are impacted by activities described in the COP with any supplies or mitigation resources	The lessee has an opportunity in the COP-specific NEPA document to demonstrate the impact of its workforce development and employment initiatives. The determination of the benefits of offshore wind to communities with environmental justice concerns was not assessed as “major beneficial” at this time. BOEM has revised the AMMM measures EJ-1 (now EJ-1a and EJ-1b [RP] in the Final PEIS) and EJ-2 (now an RP) to further reduce potential duplication with state and local requirements.

Comment No.	Comment	Response
	needed to reduce adverse impacts. Aside from onshore construction in most instances associated with Alternative B BOEM has indicated that offshore wind development will generally have minimal and temporary adverse impact to environmental justice resources. BOEM has highlighted that in many instances offshore wind activities will lead to "moderate beneficial impacts" (Draft PEIS Section 3.6.4.6.4). In Section 3.6.4.5.2 BOEM states that [italicized: "Six NY Bight projects could have long-term moderate beneficial impacts on environmental justice populations if workforce development and employment initiatives are implemented for local communities."] Note that in both New York and New Jersey workforce development and employment activities bringing economic benefits of clean energy to EJ communities are part of their Offshore-wind Renewable Energy Certificate (OREC) solicitations thus Ocean Winds would suggest that the benefits of offshore wind to EJ should be categorized as "major beneficial". Any onshore development associated with offshore wind would be subject to local and state laws and permitting. As BOEM notes in Draft PEIS Section 3.6.4.1.1 [italicized: "both New York and New Jersey have identified environmental justice communities at the U.S. Census block-level using criteria that exceed the federal environmental justice community definitions."] Ocean Winds notes that both states have robust laws that address the protection of environmental justice communities from the impacts of planned industrial activity. For example as an addition to its 2019 Climate Leadership and Community Protection Act (Chapter 106 of Acts of 2019) last year New York enacted the strongest environmental justice law in the United States. The new law provides that the Department of Environmental Conservation [italicized: "shall not issue an applicable permit for a new project if it determines that the project will cause or contribute more than a de minimis amount of pollution to a disproportionate pollution burden on the disadvantaged community."] NY Environmental Conservation Law Sec. 70-0118. In 2020 New Jersey adopted an environmental justice law that imposed substantive limitations to development and assessment of cumulative and disproportionate impacts (NJ P.L. 2020 Chapter 92). Both states have laws requiring assessment of potential impacts on	As revised, lessees may indicate which state or local requirements address the AMMM measures and can reference applicable specific plans prepared to meet state or local requirements to satisfy the AMMM measures. Note that EJ-2 has been revised to be an RP as an "Environmental Justice Impact Mitigation Resources Plan." EJ-2 recommends documenting whether local requirements are in place that would reduce impacts and address the need for mitigation resources. AMMM measure EJ-1a does not require duplication of state or local requirements provided the lessees can document which specific state or local requirements address the AMMM measure.

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	overburdened communities and outreach to affected communities. Both states also require documentation of communication and efforts at avoidance, minimization, mitigation, and monitoring as part of their OREC solicitation requirements. Unless BOEM is bringing into question local and state ability to enforce their own laws and regulations BOEM should assume that offshore wind projects would meet applicable state permitting and EJ laws in EJ communities defined by those states in ways determined by those states which are the closest to those communities. Separate federal plans would be redundant and create additional unnecessary burden on developer creating cost that ultimately will find their way to the bills of electricity customers including residents of EJ communities. As BOEM notes in Draft PEIS Section 3.6.4.1.4 [italicized: "Environmental justice assessments are strongly place-based analyses."] Deferring to States on the Environmental Justice Populations within their jurisdiction would support a place-based approach.	
BOEM-2024-0001-0441-0002	The growth and evolution of the offshore wind industry in New Jersey represents tremendous opportunities to dial back the effects of decades of fossil-fuel emissions provide historically disadvantaged communities with access to the green economy education and workforce development and allow small business owners to grow their businesses in connection to this emergent industry. It is important that the Bureau of Ocean Energy Management's Draft PEIS process take a hard look at mitigation recommendations that would delay the construction of offshore wind projects as well as the tremendous economic benefits they would unlock for women owned businesses and overburdened communities.	Thank you for your comment. The PEIS evaluates the effects of development of the NY Bight projects and identifies and analyzes AMMM measures that would avoid, minimize, and mitigate those effects. The AMMM measures presented in the Draft PEIS have been substantially revised to provide opportunities for lessees to document how existing state or local requirements would meet the AMMM measures, and to further reduce potential duplication of mitigation requirements. BOEM does not anticipate that EJ-1a (previously part of EJ-1 in the Draft PEIS) and EJ-3 would alter project timelines. Note that EJ-2 has been revised to be an RP as an "Environmental Justice Impact Mitigation Resources Plan."
BOEM-2024-0001-0470-0019	[Italics: a) Environmental Justice analyses fail to consider electricity supply cost and reliability as Impact Producing Factors (IPFs) Issues or Indicators]The PEIS indicates both New York and New Jersey have identified environmental justice (EJ) communities at the U.S. Census block-level affected by the Proposed Actions including seven counties that exceed thresholds for environmental justice in New Jersey Atlantic County Camden County Cumberland County Essex County Hudson County Middlesex County and Union County and	Thank you for your comment. The price of the power generated by the projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state’s offshore wind procurement laws and regulations. Refer to response to comment BOEM-2024-0001-0357-0059.

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	three counties that exceed thresholds for environmental justice in the State of New York Kings County New York County and Queens County based on their minority populations. Table 3.6.4-3 on page 3.6.4-16 of the PEIS describes "Issues and indicators to assess impacts on environmental justice. While effective describing many of the EJ issues created by major actions the analysis fails to include the impacts stemming from the most basic Impact Producing Factors (IPF) associated with energy infrastructure recapitalization: supply reliability and price of electricity. EJ Communities disproportionately rely on electricity especially in the urban setting. They use electrified mass transit walk streets that must be lit attend school day and night require sanitation medical and safety services need access to secure (refrigerated) food use myriad other public and private services and want warm lit homes. EJ communities also need jobs in commercial and industrial enterprises that re- quire reliable affordable electricity and many of the services described. The PEIS must evaluate electricity supply reliability and price as Impact Producing Factors for this PEIS and other analyses addressing plans and approvals for these projects.	The proposed projects would supply electric power to the grid. The grid operators will review each proposed offshore wind farm to ensure that the electric grid will continue to perform reliably with the addition of each project.
BOEM-2024-0001-0474-0008	Among other reasons the action is Arbitrary because while purporting to reflect environmental Justice the proposed action decimates and impoverishes other communities.	Thank you for your comment. The PEIS evaluates the effects of development of the NY Bight projects and identifies and analyzes AMMM measure to avoid, minimize, and mitigate those effects. Please see other sections that describe impacts beyond those on communities with environmental justice concerns. BOEM acknowledges that both potential benefits and burdens to communities should be analyzed at a more granular level; the PEIS does not contain the specificity required to make determinations regarding disproportionate and adverse impacts on communities with environmental justice concerns, but location-specific impacts will be assessed by the COP-specific NEPA documents. These NEPA documents will also be available for public comment.
BOEM-2024-0001-0522-0002	Environmental Justice I support offshore wind development because the transition to clean energy is key to combating the systemic racism that has forced low-income communities and families of color to disproportionately bear the brunt of pollution for generations. Communities of color and	Thank you for your comment, the topics you describe are included in the environmental justice analysis.

Comment No.	Comment	Response
	low-wealth communities suffer higher rates of asthma heart disease and cancer because they are located close to power plants that burn dirty fossil fuels. Investing in offshore wind won't just fight climate change it will also help people of color and urban residents breathe easier. I call on BOEM to do whatever it can to accelerate our transition to a clean energy future to protect the health and welfare of New Jersey's most vulnerable communities.	
BOEM-2024-0001-0522-0004	This project will lead to beneficial health outcomes while reducing air pollution especially in communities of color that bear the brunt of emissions from fossil-fuel-burning power plants and suffer disproportionate health impacts like asthma.	Thank you for your comment, the topics you describe are included in the environmental justice analysis.
BOEM-2024-0001-0529d	But I also want to emphasize the efficacy of accountability for the ensuring of equity for front line, overburdened communities who normally bear more of a brunt of pollution than other communities here in New Jersey and other places. And I would like for offshore wind to ensure that these green jobs will help to support these urban front line communities, and that some of the subsidies could be definitely set aside and allotted to reduce the energy cost for low and moderate-income individuals in New Jersey, and also New York, since this seems like a pretty much joint geographic project.	Thank you for your comment. COP NEPA documents will provide site-specific analysis, which will include community characteristics at a more granular level. These NEPA documents will also be available for public comment. The COP-specific NEPA documents will assess potential benefits and impacts on communities with environmental justice concerns. In AMMM measure EJ-1 (now EJ-1a in the Final PEIS), lessees must provide an Environmental Justice Communications Plan that includes when, how, and to whom employment opportunities are advertised and how the lessee plans to maximize access to those opportunities for low-income and minority populations; this would include the communication and advertising for training programs and hiring processes.

P.5.17 Land Use and Coastal Infrastructure

Table P.5-17. Responses to Comments on Land Use and Coastal Infrastructure

Comment No.	Comment	Response
BOEM-2024-0001-0063-0007	Infrastructure Challenges: The construction and maintenance of offshore wind farms require significant infrastructure and critics express concerns about the feasibility of developing and sustaining this infrastructure particularly in challenging marine conditions.	Comment noted.
BOEM-2024-0001-0313-0053	Affected Environment and Environmental Consequences 3.6.5-11 and 3.6.5-9 The PEIS states "Traffic: Road traffic associated with one NY Bight project is not anticipated to noticeably add to traffic on the local road system and is therefore anticipated to have the same negligible impact as under the No Action Alternative." And "Traffic: Offshore wind projects could result in increased road traffic and congestion that may affect land use and coastal infrastructure because traffic volumes may dictate where residents and businesses choose to locate. Onshore construction of cables for offshore wind projects would likely disrupt road traffic for a short period of time. The exact extent of impacts would depend on the locations of landfall and onshore transmission cable routes for offshore wind energy projects and traffic management plans developed with local governments. Traffic impacts on land use and coastal infrastructure are anticipated to be negligible." Comment Amazingly this appears to be the only analysis and conclusion on vehicular traffic associated with the PEIS. There are numerous emissions associated with construction truck trip traffic construction personnel driving to work sites transportation associated with manufacturing and processing and those people commuting and transporting materials. It is only fair that since the PEIS calculates the purported economic benefit from all the construction jobs created that it also utilize the same metrics to calculate the emissions estimated from all of these jobs and people as not to inadvertently present only one side of the impacts. Many times in the PEIS the analysis starts from the ports but there is a significant amount of work involved that should be analyzed as part of these projects prior to that starting point which is omitted in the environmental impacts analysis. Further DER is unaware of the	Construction emissions and the impact on air quality are discussed in Section 3.4.1.4.1 of the PEIS. Construction emissions are typically further discussed at the COP-specific NEPA stage. The statement regarding negligible traffic means that there will be a negligible effect on the local land use and coastal infrastructure. Traffic may occur, but it is not anticipated to have a significant impact. Traffic management plans may be developed in coordination with local governments to mitigate potential traffic-related impacts on the local roadway system.

Comment No.	Comment	Response
	mechanism or precedent for the referenced traffic management plan cited above and the logistics for review concurrence and implementation to minimize impacts to local roadways. It also seems inconsistent with the PEIS whereby there is negligible traffic but then there is a statement indicating that there will be associated traffic.	
BOEM-2024-0001-0313-0054	Affected Environment and Environmental Consequences 3.6.5-8 The PEIS states "Presence of structures: Planned and ongoing offshore wind projects would add onshore substations O&M facilities and overhead or underground transmission connections to the regional power grid. Improvements to coastal infrastructure such as bulkheads or marinas could also be made to support offshore wind activities. BOEM expects that onshore export cables would generally be buried and would not introduce aboveground structures to the geographic analysis area for land use and coastal infrastructure. Onshore substations O&M facilities and overhead electric power transmission lines would be sited consistent with local zoning regulations and ordinances or would be required to obtain a zoning change or other relief. Given the existing level of development in the geographic analysis area and that facilities would be sited consistent with local zoning regulations BOEM anticipates the addition of onshore infrastructure for offshore wind would have negligible impacts on land use. Improvements made to coastal infrastructure such as bulkheads or marinas to support offshore wind activities would have beneficial impacts on land use and coastal infrastructure. As described in Section 3.6.9 Scenic and Visual Resources visibility of offshore WTGs would vary with distance from shore topography and atmospheric conditions. The presence of WTGs would have negligible impacts on land use because while WTGs could be visible from some shoreline locations in the geographic analysis area the presence of WTGs would not be expected to change existing land use patterns." Comment There appears to be a fundamental disconnect and misunderstanding about Town zoning and land development regulations. It is presumptive and dismissive of the local importance of planned redevelopment consistent with community character and the great efforts the town takes to maintain the suburban quality of life enjoyed by our residents to imply that there will be no impacts without analysis and worse to indicate if the structure is non-	Because specific onshore project component locations are unknown at this time, local and location-specific land use plans, and land use and zoning regulations, are not analyzed in the PEIS. Such plans and regulations will be incorporated and analyzed in the analysis at the COP-specific NEPA stage when specific component locations are known. Also at this COP-specific NEPA stage, there will be additional opportunities for cities and towns to express their concerns to BOEM in an effort to mitigate potential concerns. Additionally, as the referenced analysis states, onshore components would be developed within the regulations of each town's or city's local regulations to avoid adverse impacts on the community.

Comment No.	Comment	Response
	compliant then the developer will simply seek a variance (which by very definition would mean that the project is inconsistent with the standards and requirements of standard as of right development in the Town) and somehow makes the logical leap to declare that this will have no impact. There are a number of concerning and incompatible sentiments in this statement for which the town takes issue. In summation the PEIS conclusion is not supported by the conclusion or substantiated by the weak "analysis" in the PEIS.	
BOEM-2024-0001-0355-0006	Compromise of infrastructure sinkholes/shifting soil around buildings which could also cause buildings to shift or potentially be condemned. (This will be super important to the condo buildings and will be incredibly costly when lawsuits ensue)	Comment noted.
BOEM-2024-0001-0355-0015	Sounds that can be heard from miles away that cause sleep and health disturbances.	Comment noted.
BOEM-2024-0001-0355-0019	Compromising infrastructure that can cause properties to potentially shift and sink this would cause many homeowners to be displaced? Who is paying for their displacement and repair of their properties? The EMFs and subsequent health consequences from the xs.	Homeowners and businesses are not anticipated to be displaced from offshore wind projects. If necessary, property within an easement/ROW will be acquired from the landowner (e.g., utility company). At this stage, the specific locations of onshore facilities are not known, and they will be determined at the COP-specific NEPA stage. BOEM has added a discussion of potential health effects from EMF from onshore cables in Section 3.6.5.3.2 under the EMF IPF.
BOEM-2024-0001-0355-0021	Removal of trees that won't be replaced.	Comment noted.
BOEM-2024-0001-0355-0045	A case and point to consider. Recently in Margate a sewer line needed to be replaced. The project affected the water table and 7 houses along the two blocks where the work was conducted on Amherst Avenue. When the pumping of the water started for the trench the homes started shifting and had severe damage to their homes. Huge lawsuits followed. The homeowners had to wait with their sinking unsafe homes while decisions were made about assistance and insurance money to fix their homes. What happens if buildings (especially large ones like the Ocean Club) start shifting due	Please refer to response to comment BOEM-2024-0001-0355-0019. Burying electric cables according to industry standards should not produce shifting effects.

Comment No.	Comment	Response
	to this trenching and digging to put LARGE underground cable from these wind turbines to the substations.	
BOEM-2024-0001-0355-0046	Other questions to be answered BEFORE this project is approved:- Will there be a risk of sinkholes or soil movement in streets or under properties as a result of running these cables underground?- Who will be responsible for all the displaced residents and repairs if things start to shift with this trenching to pull these underground cables through?- What are the health effects of the high level of EMFs that will be emitted from these underground cables? Have studies been done? If not we should wait until more data is available. This is a barrier island with lots of underground water tables. Disrupting the water tables could lead to unforeseen problems that could be devastating.	Please refer to responses to comments BOEM-2024-0001-0355-0019 and BOEM-2024-0001-0355-0045.
BOEM-2024-0001-0355-0047	Environmental issues are much higher with underground cables as the ground is excavated at approximately 6-7 feet deep and 4 feet wide and splicing vaults at around every 3000 feet. The issue of cancers and other health issues are much higher with the proposed high voltage direct current converter to alternating current station is an issue along with noise and radio frequencies. Is there a peer-reviewed health study of this type of onshore wind project in the United States and if not why not?	BOEM has added a discussion of EMF impacts from onshore cables in Section 3.6.5.3.2 under the EMF IPF. As described in the analysis, maximum emissions directly above the onshore export cable are not anticipated to exceed the reported human health reference levels of 2,000 milliGauss for the general population, and impacts would be long-term but negligible.
BOEM-2024-0001-0355-0050	Placing buried onshore wind turbine high-voltage direct current cables through well-established residentially zoned neighborhoods with this high of voltage is new in the United States. Generally high-voltage direct current cables operate through commercial zones transportation and electric rights of way or between countries. As such more studies need to be done before this is approved. The Federal Housing Authority and Veterans Administration have home loan restrictions on properties located near high-voltage lines. This will certainly be the case for the high voltage underground lines.	Comment noted.
BOEM-2024-0001-0474-0010	Among other reasons the action is Arbitrary because the proposed action fails to recognize evaluate assess and mitigate the secondary impact of the proposed offshore wind development and the resulting destruction of the ocean on the land and the coastal communities. Among other reasons the action is Arbitrary because the proposed action is tantamount to a taking of property in that the the value of the ocean is usurped from the citizens members of the public for the	In this PEIS, BOEM has prepared Appendix G, *Mitigation and Monitoring,* which lists all the AMMM measures. The AMMM measures are also listed and discussed in each individual resource section that applies. At the COP-specific NEPA stage, both the developer and BOEM will have additional measures in place to

Comment No.	Comment	Response
	enrichment of the offshore wind developers to the detriment of the public good.	prevent negative adverse impacts on the ocean, land, and coastal communities.

P.5.18 Navigation and Vessel Traffic

Table P.5-18. Responses to Comments on Navigation and Vessel Traffic

Comment No.	Comment	Response
BOEM-2024-0001-0063-0004	Shipping Conflicts: The placement of turbines will pose challenges for shipping lanes and navigation routes leading to logistical issues and safety concerns for maritime activities in the region.	Section 3.6.6 analyzes the effects of the six NY Bight lease areas on navigation, including shipping lanes and safety. BOEM has identified AMMM measures and RPs in Appendix G that would minimize effects on navigation. In addition, BOEM may identify additional measures during project-specific NEPA review to further mitigate impacts on navigation.
BOEM-2024-0001-0122-0007	Navigation Challenges: Fishing vessels and maritime activities will face challenges navigating around wind farm structures potentially creating hazards and disrupting established navigation routes. Intermittency and Reliability: Wind energy is intermittent and depends on wind availability. This intermittency will pose challenges to the reliability of the power supply requiring additional infrastructure for backup sources or energy storage solutions	Section 3.6.6 analyzes the effects of the six NY Bight lease areas on navigation, including shipping lanes and safety. BOEM has identified AMMM measures and RPs in Appendix G that would minimize effects on navigation. In addition, BOEM may identify additional measures during project-specific NEPA review to further mitigate impacts on navigation. Reliability of the electrical grid is the responsibility of the grid operator, which must take into account all forms of electrical generation that feed into the grid. In COPs received to date on the Atlantic OCS, offshore wind developers have not proposed backup sources of power or battery energy storage systems. It is possible that other development companies may independently develop these systems to support offshore wind, which would be subject to their own environmental review and permitting outside of BOEM's jurisdiction.
BOEM-2024-0001-0313-0055	Figure 3.6.6-2. TSS separation zones precautionary areas and USCG proposed fairways anchorages and precautionary areas in the geographic analysis area. Page 3.6.6-6. Comment There is no discussion regarding the "ocean disposal sites" in the PEIS which raises concerns. What will be the visual impact to the community regarding the vessels and dumping how many vessel trips what measures are included to mitigate turbidity what is the ecosystem impact of adding dredging material to these locations. How were	There are no existing ocean disposal sites within the NY Bight lease areas (refer to Figure 3.6.7-3). Dredged material generated during development of any of the NY Bight projects may be sidecast in the vicinity of the dredging operation or be disposed of off site at existing permitted disposal sites. If additional disposal areas are required, they would be required to be permitted by USACE, and the impacts of the new disposal sites would be evaluated in a project-specific NEPA document that

Comment No.	Comment	Response
	they selected were the impacts regarding littoral drift and sedimentation and will there any impacts to canals beaches estuaries tidal wetlands etc. There is also no discussion regarding the sediment testing prior to dumping it close to the shoreline to make sure that previously undisturbed contaminated sediments are not brought to the beach or impacting water quality.	would include the analysis of impacts related to sedimentation, visual resources, and navigation.
BOEM-2024-0001-0322-0001	In our previous comments to BOEM AWO has evaluated the environmental impact of the proposed placement of Wind Energy Areas based on two primary criteria: whether vessel operators will have the space to navigate safely along traditional towing vessel transit lanes and whether mariners will have options to adjust their course if circumstances demand. Ensuring that these two criteria are met will reduce the likelihood of collisions and allisions with wind farms and improve the ability of vessel operators to right a vessel in the event of an emergency; these protective measures will in turn reduce the chance of an environmental incident. We appreciate that BOEM has taken steps to avoid these conflicts with the New York Bight leases.	Comment noted.
BOEM-2024-0001-0331-0044	The PEIS Does Not Address the Cumulative Impact of Vessel Traffic for Atlantic Coast Projects The PEIS disconcertingly states that that a single project in the NY Bight lease areas would generate a small increase in vessel traffic and that cumulative vessel traffic in the NY Bight would only increase from minor to moderate impacts. What this ignores is the total number of vessels in the ocean during the construction of the 6 projects as well as vessels traveling in the ocean in nearby projects located in leases numbers 049905490532and 0512. According to tables 3.6.6-8 9 cable trenching vessels turbine foundations vessels survey vessels operation and maintenance vessels will be in the ocean off the NJ coast for 12 leases off the NY coast during the years of 2024- 2035. Just off the coast of New York there will be 1218 vessel round trips for construction and 2188 round trips for operation and maintenance. This is in addition to the vessel traffic for the projects off the coast of New Jersey in lease area numbers 0499 0549. 0532 0512 which the document preparers fail to include.	Section 3.6.6 evaluates the impacts on navigation and vessel traffic from the NY Bight projects alone and from the NY Bight projects in combination with ongoing and planned activities. Existing vessel traffic in the region is characterized using Automatic Identification System (AIS) data in Table 3.6.6-2 and Figure 3.6.6-3. The cumulative impacts of the six NY Bight projects in combination with ongoing and planned activities, including other offshore wind projects, are analyzed in Section 3.6.6.4.3. The section describes how the NY Bight projects would contribute to increases in vessel traffic in combination with other projects in the region. The section cites a New York State Energy Research and Development Authority (NYSERDA) modeling study that shows that the relative increases in vessel traffic in New York State waters resulting from offshore wind projects in the region are small compared with the total volume of vessel traffic anticipated over time. No similar studies were conducted for New Jersey. For each COP submitted by lessees for the NY Bight leases, a separate NSRA and COP-specific NEPA analysis will be conducted that will further evaluate impacts on vessel traffic.

Comment No.	Comment	Response
BOEM-2024-0001-0357-0006	Neither this draft program EIS or any project specific EIS provides a cumulative assessment of the increased safety risk to commercial and military vessel traffic along the East Coast due to the likely channeling of all that traffic into narrow corridors in between the wind energy lease areas or the need if the vessels are allowed into the lease areas for them to meander their way through those areas (See Enclosure III). No AMMM measures are presented to mitigate this cumulative risk.	Section 3.6.6 describes the effects on safety from the NY Bight projects alone and in combination with other ongoing and planned activities, including offshore wind. Under the Presence of Structures IPF in Section 3.6.6.4.1 and Section 3.6.6.4.2, BOEM described the potential for increases in vessel incidents associated with the presence of wind turbines and vessel traffic in the area in and around the lease areas. The percentage increase in allision and collision risk cited in these sections is based on NSRAs from nearby lease areas, which take into account existing and future vessel traffic in the region. The USCG has already established standards and guidelines for offshore wind farms to minimize the risk of vessel incidents. In addition, BOEM has identified an RP in Appendix G (MUL-25) that would encourage lessees to establish turbine grid layouts, spacing, markings, and lighting among lease areas to minimize navigational hazards. For each COP submitted by lessees for the NY Bight leases, a separate NSRA and COP-specific NEPA analysis will be conducted that will further evaluate impacts on safety and may require additional mitigation measures.
BOEM-2024-0001-0357-0046	Commercial and military vessel safety-Cumulative Impacts. Navigation Safety for Vessels. Notwithstanding a general and conclusory presentation in the Atlantic Shores South draft EIS Section 3.6.6 to the contrary the impacts on vessel traffic navigation safety and on the North Atlantic right whale from the navigation aspects of the project will be quite significant. Buried in one sentence on page 3.6.6.3 is the reason for that. That page expresses BOEM support for the US Coast Guard creation of a deep draft vessel lane just east of the lease area. Other parts of the discussion refer to the assumptions made in the DEIS regarding collision and allision risk that vessel traffic will be rerouted around the project area-but it does not say to where. What the DEIS failed to mention is that with turbines planned to be placed in the farther -out Hudson South area as well, all that rerouting will have to go in between the Atlantic Shores lease area in the Hudson south area in an 11-mile wide (potentially 6.6 miles) deep draft vessel corridor.	While the comment appears to be referring to the Atlantic Shores South Draft EIS and not the NY Bight PEIS, BOEM notes that the NY Bight PEIS analyzes the cumulative effects of the placement of structures in the NY Bight lease areas and Atlantic Shores South lease area (in addition to other ongoing and planned projects) on navigation and vessel traffic. As shown in Figure 3.6.6-2, there is a proposed St. Lucie to New York Fairway in between the Atlantic Shores South lease area (OCS-A 0499) and OCS-A 0541, where vessel traffic could pass and avoid transiting through either lease area.

Comment No.	Comment	Response
BOEM-2024-0001-0357-0047	The definition of a shipping lane is "an official route that ships must follow when they sail from one place to another". Changing the name to "vessel corridor" does not give BOEM or the Coast Guard the authority to change the historic safety regulation and rules associated with shipping lanes. The United States standard requirements of fixed structure in and around shipping lanes in the Gulf of Mexico should be consistent with the Atlantic. "No structure may be placed within two Nautical miles of any shipping lane". That goes for transit lanes also. The developer wanting to maximize the development site for electric generation should not be at the cost of life and property. The standards for placement of structures to the proximity of shipping lanes should be consistent in all waters. Applying that restriction here narrows the shipping corridor width to 6.6 miles. The implications of that to navigation safety and the North Atlantic right whale migration could be enormous.	As described in Section 3.6.6.1.1, the USCG published the Consolidated Port Approaches Port Access Route Studies (CPAPARS) in 2023, which provides recommendations for a system of shipping safety fairways and routing measures along the Atlantic Coast, taking into consideration planned offshore wind lease areas. Comments on the establishment of the fairways between the lease areas is out of scope of this PEIS, which presents a programmatic analysis of the six NY Bight lease areas to characterize the types of impacts that could occur and mitigation measures that could minimize those effects. USCG is a cooperating agency for the PEIS and was involved in reviewing and providing input on the document. All offshore wind projects are required to follow current guidance and regulations, as authorized by BOEM and other regulatory agencies.
BOEM-2024-0001-0357-0048	Regarding navigation safety the Atlantic Shores South draft EIS on page 3.6.614 acknowledges the marine radar degradation that can occur from the wind turbines but defers a real analysis to the "site specific". But the site-specific cannot address the restrictions form all projects together. The NY Bight program EIS should have provided a radar interference study showing the effect on marine radars for both civilian and military vessel traffic in this deep draft lane and other possible routes from large rotating blade wind turbines on both sides of those paths. That Atlantic Shores South draft EIS presents an accident analysis on page 3.6.618 but the assumptions made for it are no longer valid in two respects. First it did not acknowledge the concentration of vessel traffic described just above and the cumulative impact of projects and second the analysis assumes that there would be "little impact" on radar capability from the wind turbines which we know today based on the NAS Report and others is no longer the case. Therefore its low-risk results are invalid. The NY Bight EIS needs to provide an updated vessel risk analysis considering the vessel traffic concentration into specific narro paths the cumulative impact of wind projects on either side of those paths and the expected radar interference.	Sections 3.6.6.3 and 3.6.6.4 describe the potential effects on marine vessel radar from the presence of offshore wind structures. The PEIS acknowledges that marine vessel radars are not optimized to operate in a WTG environment and that marine radar on vessels near or within a NY Bight lease area would likely be affected during the O&M period. BOEM expects the maritime industry to implement both technological and non-technology-based measures to reduce impacts on marine radar, including using AIS and electronic charting systems more, embracing new technologies like LiDAR, employing more watchstanders, and simply avoiding wind farms altogether. Regarding the vessel risk analysis, NSRAs will be developed for each COP produced for the NY Bight leases, which will inform the COP-specific NEPA analysis.

Comment No.	Comment	Response
BOEM-2024-0001-0426-0009	How will turbines sited in major shipping corridors in the New York Bight affect the movement and cost of goods and services?	The NY Bight lease areas are not sited within current or proposed traffic routing measures, such as Traffic Separation Schemes and Fairways.
BOEM-2024-0001-0447-0007	Transit Safety Concerns The GSSA has always supported the need for transit lanes proposed in the lease area. Based on our experience transit corridors of a minimum of 2nm are necessary in order to keep our state's fishermen safe at sea and to lessen the economic impact. It is also worth noting that without transit corridors there is a significant impact to fishermen who operate under a day at sea quota. Specifically in the case of Scallop fishery identified a lack of a transit corridor would have direct impact on the time constrained permit of the industry with a limited number of days at sea and running 24-hour clocks. However this PEIS is proposing turbines spaced 0.6x 0.6 nm apart and proposes no transit lanes.	The minimum spacing of the RPDE is 0.6 nautical mile x 0.6 nautical mile, but the actual proposed spacing for each COP may be wider. During the lease sale process, BOEM sited the NY Bight lease areas to provide adequate spacing between lease areas for navigation purposes, and the lease areas avoid existing and proposed Fairways and Traffic Separation Schemes.

P.5.19 Other Uses (Marine Minerals, Military Use, Aviation, and Scientific Research and Surveys)

Table P.5-19. Responses to Comments on Other Uses

Comment No.	Comment	Response
BOEM-2024-0001-0314-0002	The relatively short lifespan of offshore wind turbines approximately 20-25 years raises concerns about the long-term viability and cost-effectiveness of these projects. The contracts for this project are for a period of 20 years which does not inspire confidence in the final outcome since it aligns so closely with the end of life of the turbines.https://www.twi-global.com/technical-knowledge/faqs/how-long-do-wind-turbines-lasthttps://www.wind-watch.org/news/2019/08/07/wind-turbine-blades-being-disposed-of-in-casper-landfill/ Cybersecurity concerns cannot be overlooked. The energy sector is increasingly becoming a target for cyberattacks and offshore wind farms are no exception. Securing the operational technology that controls wind turbines from cyber threats is critical to ensuring the reliable supply of electricity and protecting sensitive data. The electric grid we have in place needs to be fortified and protected from cyber attacks before we can throw billions at new	Each lease area will undergo project-specific environmental analyses through the development and submittal of a SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. In the unlikely event of a cybersecurity attack, coordination with the USCG would provide clear instructions regarding procedures to be followed during emergency incident scenarios. The effects of a cybersecurity attack would depend on the magnitude and location of the attack. Given the dispersed nature of the potential offshore facilities, it is unlikely that an attack would affect all offshore structures. Specific responses to such incidents will be discussed at the COP NEPA stage. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in

Comment No.	Comment	Response
	technology.https://www.cfact.org/2021/04/05/cybersecurity-of-wind-power-a-growing-concern/https://www.techtimes.com/articles/272624/20220305/europe-cyberattack-results-massive-internet-outage-5-800-wind-turbines.htmhttps://securityboulevard.com/2022/03/why-the-cyber-incident-at-a-large-wind-turbine-manufacturer-is-bad-news/https://www.pv-magazine.com/2022/03/01/satellite-cyber-attack-paralyzes-11gw-of-german-wind-turbines/https://www.sciencedaily.com/releases/2024/01/240124132757.htmhttps://energycentral.com/news/grid-reliability-hot-seat-again-house-energy-subcommittee-hears-grid-operatorshttps://www.rechargenews.com/wind/most-tech-savvy-teenagers-could-shut-down-a-wind-farm/2-1-536155 The security of undersea cables essential for transmitting electricity from offshore wind farms to the shore is a significant concern. These cables are susceptible to damage from weather and as well as sabotage. Repairing or replacing damaged cables is a costly and complex process that could lead to substantial downtime and further increase the operational costs of wind farms.https://www.energylivenews.com/2023/09/22/subsea-cable-failures-pose-global-threat-to-offshore-wind/	this PEIS and identifies additional analysis that will be included in the COP NEPA analysis for each resource area, including Other Uses.
BOEM-2024-0001-0324-0001	We submit these comments on behalf of the North American Submarine Cable Association ("NASCA") in connection with the above-referenced Notice of Availability of a Draft Programmatic Environmental Impact Statement ("PEIS") for Expected Wind Energy Development in the New York Bight ("Notice") [Footnote 1: Notice of Availability of a Draft Programmatic Environmental Impact Statement for Expected Wind Energy Development in the New York Bight 89 Fed Reg. 2251 (Jan. 12 2024) ("Notice").] to urge BOEM to recognize expressly the importance of submarine cable infrastructure and the need to coordinate with the owners and operators of such infrastructure throughout all stages of leasing activity including the preparation of a PEIS to ensure that siting coordination is a priority. While NASCA appreciates that BOEM has made some efforts to recognize submarine cable owners and operators as stakeholders with infrastructure deployed on the Outer Continental Shelf ("OCS") it has yet to take more concrete steps to	BOEM COP guidelines outline steps lessees should take to coordinate with existing seabed users, including submarine cables, according to International Cable Protection Committee recommendations. BOEM has required lessees to provide cable crossing agreements, or evidence of attempts to reach cable crossing agreements, as part of COP T&Cs.

Comment No.	Comment	Response
	facilitate early-stage coordination. The extensive leasing activity planned for the New York Bight area including the vast number of export and inter-array cables that will be deployed outside specific lease areas underscore the need for early coordination.	
BOEM-2024-0001-0324-0002	The submarine cable industry is a key stakeholder with respect to proposed uses of the Outer Continental Shelf ("OCS") as its members have dozens of submarine cables deployed on the OCS on both coasts including some that transit through the New York Bight. Submarine telecommunications cables form the backbone of our modern digital infrastructure. Submarine cables not satellites continue to carry approximately 99 percent of the world's Internet voice and data traffic. [Footnote 3: Doug Brake Submarine Cables: Critical Infrastructure for Global Communications Info. Tech. & Innovation Found. at 1 (Apr. 2019) https://www2.itif.org/2019-submarine- cables.pdf.] Activities that rely upon submarine cables span the full range of economic and social activities: submarine telecommunications cable enable Internet connectivity and electronic commerce global payment networks mobile wireless backhaul government and military communications telemedicine research remote work and video conferencing and communications with friends and family.[Footnote 4: See International Cable Protection Committee ICPC Calls on Governments and Industry to Facilitate and Expedite Submarine Cable Installation and Repair During the COVID-19 Pandemic in Order to Protect Internet Connectivity and Critical Communications 1 (Apr. 3 2020) https://www.iscpc.org/documents/?id=3299.] The global nature of the Internet and the networks that operate over it mean that even communications within a domestic or local area (such as communications up and down the Eastern seaboard) rely on submarine cable infrastructure to deliver communications and services. This reliance is growing with more cables planned as our cultural social economic and national security institutions and activities increasingly depend on digital cloud-based platforms. It is imperative that the protection of submarine cable infrastructure be a key priority for BOEM as well as for existing and potential lease holders including all those involved in planning development	Each lease area will undergo project-specific environmental analyses through the development and submittal of a SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. Cable activities will be discussed at the COP NEPA stage, and further coordination opportunities will be discussed then. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that will be included in the COP NEPA analysis for each resource area, including existing submarine cable infrastructure.

Comment No.	Comment	Response
	installation and maintenance of the power transmission lines that will link renewable energy platforms to the coast.	
BOEM-2024-0001-0324-0003	As an interested stakeholder NASCA filed comments on BOEM's initial proposed sale notice for the New York Bight area in 2021[Footnote 5: Comments of NASCA Docket No. BOEM-2021-0033 (filed Aug. 13 2021) ("NASCA NY Bight Comments"). See also Comments of NASCA Docket No. BOEM-2018-0004 (filed Jul. 30 2018) ("NASCA 2018 Comments").] to stress the importance of incorporating cable awareness and spatial separation standards in BOEM's leasing program to ensure that potential lease holders take into account existing and planned infrastructure transiting in or near the proposed lease areas. NASCA submits these comments to restate its position and to emphasize the importance of developing a comprehensive approach to coordination and mitigation between offshore wind and submarine cable infrastructure an approach that is even more vital given the extensive transmission line infrastructure that is anticipated to be deployed both within and outside the proposed lease areas.	Each lease area will undergo project-specific environmental analyses through the development and submittal of a SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. Additional coordination with interested stakeholders and existing and planned cable infrastructure will be discussed at the COP NEPA stage.
BOEM-2024-0001-0324-0005	NASCA recognizes that the BOEM's COP Guidelines expressly recommend that potential lessees identify submarine telecommunications cables in the area and coordinate as early as practicable with owners and operators of that infrastructure. [Footnote 10: See BOEM Information Guidelines for a Renewable Energy Construction and Operations Plan (COP) Attach. G at 61 (May 27 2020) https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines.pdf ("COP Guidelines").] However NASCA believes that lessees should be apprised of the need to coordinate with submarine telecommunications cable owners and operators well before they prepare a COP with ready access to key recommendations and guidelines that underpin such coordination. This need is more acute when the planning entails energy transmission line deployment extending beyond the lease areas.	Each lease area will undergo project-specific environmental analyses through the development and submittal of a SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication. Future COP NEPA documents will consider impacts on existing submarine cable infrastructure.

Comment No.	Comment	Response
Marine Minerals		
BOEM-2024-0001-0313-0057	3.6.7.1.2 National Security and Military Use The PEIS states "Offshore sand and gravel resources are managed by federal and state agencies and used for coastal protection and restoration beach nourishment and habitat reconstruction purposes. Within or adjacent to the geographic analysis area BOEM USACE New York Department of State Office of Planning and Development NJDEP and New Jersey Geological and Water Survey coordinate the management of areas of potential and confirmed sand resources for these coastal management and restoration activities." Comment - It appears that there are some integral agencies that are omitted from the list of permits and approvals. For example numerous NYSDEC Divisions would be involved in aspects of the proposed action including but not limited to the tidal wetlands permitting perhaps beneficial reuse determination (BUD) processes etc. The extent and involvement of this agency should be explored and discussed in the final PEIS. Further based on DER past experience and comments from NYSDEC and responses from AECOM (source: Response to Comments Letter Dated: March 4 2022 Technical Comment Letter South Brooklyn Marine Terminal Port Infrastructure Improvements Project DEC ID: 2-6102-00120).	Thank you for the comment. The applicant is responsible for obtaining all necessary permits prior to construction and operations of the project and will do so during the COP NEPA stage.
Military		
BOEM-2024-0001-0071-0003	Putting foreign trash in OUR ocean backed by big oil companies will endanger coastal security and hinder search and rescue missions from our coast guard.	BOEM is continuing to work with the U.S. Department of Defense (DoD) and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from the impacts on military uses. Coordination with the USCG is ongoing and will be continued at the COP NEPA stage.
BOEM-2024-0001-0334-0011	RADAR: The impact to radar in my opinion has been severely underplayed. The impact of not impairing local air and sea navigation and Coast Guard search and rescue cannot be overstated. You should be required to coordinate with the US military on the national security risks to coastal thread detection AS WELL AS the functioning of RADAR GUIDED MISSILE DEFENSE SYSTEMS that may be required along the coast in war. Offshore Wind Farms Can Interfere with Ship Radar and Navigation Says New Report "The report concludes wind turbine generators have significant electromagnetic reflectivity and	BOEM is continuing to work with the DoD and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from the impacts on military uses. Coordination with the USCG is ongoing and will be continued at the COP NEPA stage. The PEIS addresses the adverse impacts of WTG structures on radar systems in Section 3.6.7.4.1, *Radar Systems*. Please refer to OU-1 and OU-3 in Table 3.6.7-6 for radar mitigation measures.

Comment No.	Comment	Response
	therefore can interfere with radar systems operating nearby. The rotating blades can also create reflections in Doppler radar systems. In particular these forms of interference could obfuscate smaller vessels and stationary objects such as buoys on radar complicating navigation decisions and increasing the risk of collision with larger vessels. Maritime search and rescue teams also rely on radar to find smaller boats their primary targets and interference could therefore also complicate rescue operations near wind farms. The report recommends the Bureau of Ocean Energy Management and other relevant agencies pursue practicable options to mitigate the interference of wind farms such as by implementing enhanced training and using reference buoys among other options. The agency should also pursue further research to fill remaining gaps in understanding how offshore wind farms affect radar used for navigation. Additionally the risk of the rigs and substations being used for foreign surveillance has not even been broached! These are foreign companies in charge of these operations some with part foreign state ownership that can also have alliances with enemies of the US. This alone should make prevent projects from being approved.	
BOEM-2024-0001-0344-0003	This experiment will interfere with homelands security destorting radar and other defensive equipment.	BOEM is continuing to work with the DoD and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from the impacts on military uses. Coordination with the USCG is ongoing and will be continued at the COP NEPA stage. The PEIS addresses the adverse impacts of WTG structures on radar systems in Section 3.6.7.4.1, *Radar Systems*. Please refer to OU-3 in Table 3.6.7-6 for radar mitigation measures.
BOEM-2024-0001-0355-0011	National security issues due to interference with satellites and radar detection of enemy ships and also inhibiting defense planes from flying overhead.	BOEM is continuing to work with the DoD and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from the impacts on military uses. Coordination with the USCG is ongoing and will be continued at the COP NEPA stage. The PEIS addresses the adverse impacts of WTG structures on radar systems in Section 3.6.7.4.1, *Radar Systems*. Please refer to OU-3 in Table 3.6.7-6 for radar mitigation measures.

Comment No.	Comment	Response
BOEM-2024-0001-0357-0037	With the close-in Atlantic Shores project we significantly degrade our military air radars in Gibbsboro NJ. Father out we do not have that.	BOEM is continuing to work with the DoD and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from the impacts on military uses. Coordination with the USCG is ongoing and will be continued at the COP NEPA stage. The PEIS addresses the adverse impacts of WTG structures on radar systems in Section 3.6.7.4.1, *Radar Systems*. Please refer to OU-3 in Table 3.6.7-6 for radar mitigation measures.
BOEM-2024-0001-0310c	The Synthesis of the Science report also mentions that NOAA is going to have problems doing stock assessments around these turbines because they need to go out and drag to take samples to know how many fish there are. Synthesis of the Science NOAA Fisheries also acknowledge that any impacts that are stock assessment surveys will lead to greater management with caution, meaning lower fisheries quotas and lost revenue for the recreational commercial industry. We've been trying to get this information out to the public but the mainstream media just wants to paint us as deniers and oil industry shields.	Thank you for your comment. The potential disruption of NMFS marine resource survey operations is noted within the Presence of Structures IPF in Section 3.6.7 of the Final PEIS. BOEM acknowledges that potential impacts associated with this interruption could be increased uncertainty in stock assessments and changes in the fishery quotas based on existing fishery management council rules.
BOEM-2024-0001-0310c	However, if NOAA can't do stock assessments it's going to lead to greater precautions. The more fish we catch the lower our quotas are the following year.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0310c for more information on potential impacts on stock assessments.
BOEM-2024-0001-0310d	For BOEM to keep in mind the recent Concordia University study of January 2024 on offshore wind farms. The study took an intensive look at the site work infrastructure of offshore wind farms and I'm quoting the study. "Complex hybrid communication architecture presents multiple access points of cyberattacks." This concerns BCS, VSC-HVDC connections. In short, to BOEM, not the U.S. Department of Defense nor you, BOEM, have a handle on cyber vulnerability. The ultimate defense of this country and its power grid come first, and currently offshore wind farms do not assist that. They are most vulnerable. Probably of all the energy renewable sources, offshore wind farms will be the most vulnerable should they occur.	Thank you for your comment. BOEM is continuing to work with DoD and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from the impacts on military uses. Impacts on military uses are evaluated in Section 3.6.7.5, *Impacts of the Proposed Action on Other Uses (Marine Minerals, Military Use, Aviation, and Scientific Research and Surveys).*

P.5.20 Recreation and Tourism

Table P.5-20. Responses to Comments on Recreation and Tourism

Comment No.	Comment	Response
BOEM-2024-0001-0063-0003	Visual Impact and Tourism Concerns: Large wind turbines in the scenic New York Bight will negatively impact the visual appeal of the area deterring tourists and affecting the local economy.	Thank you for the comment. BOEM expects that due to distance from shore (the closest NY Bight lease area is 20 nautical miles [37 kilometers] from the nearest shoreline), visual impacts are not expected to negatively impact tourism. See also response to comment BOEM-2024-0001-0313-0061.
BOEM-2024-0001-0255-0002	BOEM's 50 meter buffer zone is grossly inadequate because the barges and other construction vessels may be over 300 feet long with limited manuverability and anchoring issues. The avoidance zone should be a minimum of 100 meters and even that may be inadequate. Furthermore our organization was warned by Lamont Labs at Columbia University to stay 3.2 miles away from survey vessels using powerful and dangerous sidesan sonar associated with prelimary survey work for these wind farms and export cables. Problem is we don't know when and where these surveys will take place and which ones are dangerous. Most sport diving off the Jersey and NY coast is done within 20 miles of the shoreline during the summer and early fall in water less than 130 feet so most of these 6 windfarms are further offshore. However the export cables must come ashore and therefore powerful survey work threatens sport divers and	Thank you for the comment. The closest to shore that construction may occur is 19 nautical miles. This will not affect most sport diving that occurs within 20 nautical miles of the shoreline. BOEM expects that diving operations in the area are already aware of how to take precautions because of the significant amount of shipping traffic that currently exists. Surveys have already occurred in these areas without injury or incident to divers. When COPs are submitted to BOEM, cable routes must be clearly delineated. Those areas can be avoided during construction.
BOEM-2024-0001-0313-0043	The Town prides itself on commitment to water quality and access to clean safe beaches and the recreational resources and enjoyment of our pristine waterfront including swimming and utilization of a clean waterbody.	Thank you for your comment.
BOEM-2024-0001-0313-0061	Affected Environment and Environmental Consequences 3.6.8-4 The PEIS states "Beaches are valuable assets for recreation and tourism. Those beaches regarded as undeveloped are important tourist destinations and are often valued for their remoteness (Peregrine Energy Group 2008) and as such may be sensitive to the visual impacts of offshore wind facilities. The National Park Service Atlantic and Gulf Coast Recreation Area Survey reported that in 2007 there were only two undeveloped beaches in the geographic analysis area of New Jersey: Brigantine Inlet North and Absecon Inlet which are	Thank you for your comment. BOEM has revised the language in Section 3.6.8.1.2 to the following: "In the geographic analysis area the relatively few remaining undeveloped beaches combined with a predominantly developed coast indicates a tolerance or acceptance of coastal development in most coastal communities. Where measures for preservation of open space wetlands plantings to improve environmental quality and rigorous local review and controls are in place, project specific

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	both in Atlantic County (NPS 2007). Of the three New York State Park Beaches (Hoboken Wildwood and Jones Beach) only Jones Beach State Park has a direct line of sight to the NY Bight lease areas (NYSERDA 2021). Further within the last 10 years storms have ravaged areas in and outside of the geographic analysis area where coastal restoration is ongoing (NY DEC 2022; NJ DEP 2022). Coastal ecosystem and habitat restoration activity including beach and dune nourishment projects support recreational opportunities along the New Jersey and New York coastline. In the geographic analysis area the lack of undeveloped beaches combined with coastal construction activities currently underway indicates a tolerance or acceptance of coastal development in these coastal communities." Comment While TOBAY is not a State Park it does have a direct line of sight to the NY Bight Lease area and should be acknowledged as a significant resource along with the other beaches; also as Robert Moses is included in the visual impact analysis it appears that this beach also frequented by residents is a State Park Beach with direct line of site. It is important to note that the DER does not necessarily agree with the opinion and inferred presupposition stated above that coastal communities accept all types of development. In fact more in line with the first and second sentences of the paragraph (which appears to directly contradict the conclusion of the paragraph) preservation of open space wetlands plantings to improve environmental quality and rigorous local review and controls are in place to minimize the potential for overdevelopment especially in ecologically sensitive and floodprone coastal communities and coastal erosion hazard areas.	analyses will address potential impacts, likely by avoiding disturbances in those areas.”
BOEM-2024-0001-0313-0062	Affected Environment and Environmental Consequences 3.6.8-11 The PEIS States "Noise: Noise during construction (e.g. from pile-driving) or vehicle/vessel traffic could result in adverse impacts on recreation and tourism. Onshore construction noise near beaches parkland recreation areas or other areas of public interest would temporarily disturb the public's quiet enjoyment. Offshore construction noise could cause boaters to avoid construction areas although safety zones that USCG may establish for construction areas would be off-limits to boaters. Noise from operational WTGs would be expected to have little effect on finfish invertebrates and	Thank you for the comment. RPs MUL-5, MUL-6, and MUL-7 address noise. They focus on reducing the spatio-temporal overlap of noise, call for use of non-pile-driving foundation types, and require continued noise monitoring of all activities during all phases of construction and operations for the protection of marine life. The distance from shore for any of the proposed activities (>20 nautical miles from shore) provides that pile-driving activities would not be heard on the shore. While BOEM is not able to specifically assess the placement of cable landings and other onshore activities in this document,

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	marine mammals and consequently little effect on recreational fishing or sightseeing. Adverse impacts of noise especially from pile-driving would also affect recreation and tourism due to impacts on species important to recreational fishing and sightseeing. Using information from the Ocean Wind 1 COP noise from pile-driving the noisiest aspect of WTG installation is estimated to be 101 A-weighted decibels (dBA) at 50 feet (COP Volume III Appendix R-1 Section 2.5; Ocean Wind 2022). Most recreational fishing takes place closer to shore so construction of WTGs or OSSs would affect only a small proportion of recreational fishing. Temporary impacts from offshore construction noise will more likely affect recreational fishing for offshore species (e.g. tuna shark and marlin). Offshore construction noise also could contribute to temporary impacts on marine mammals with resulting impacts on chartered tours for whale watching or other wildlife viewing. BOEM qualitatively analyzed impacts on recreational fisheries in the Atlantic OCS region during the offshore construction phase and found slightly negative to neutral impacts on recreational fisheries from both direct exclusion of fishing activities and displacement of mobile target species by construction noise (Tougaard 2008)." The PEIS goes on to state regarding the potential mitigation for this impact producing factor as "REC-1 would reduce impacts on recreational activities or tourism-based businesses by scheduling onshore and nearshore construction outside of the busy summer tourist season. Increased vehicle traffic, road closures and potential limitations on recreational access would still occur but they would affect fewer visitors and summertime recreational activities; impacts from land disturbance would remain minor. Using equipment and technology to limit noise levels (MUL-5) could reduce impacts on recreational activity near onshore construction sites. Because the NY Bight project would have to comply with applicable state or local noise regulations regardless of alternative and because the specific types of equipment and reductions in noise levels are not known at this time, BOEM anticipates any change in impacts realized by this measure would likely be small." (page 3.6.8-20) Comment Despite DER concerns and comments regarding segmentation the PEIS has made it clear that the Points of Interconnection (POIs) and onshore activities are not	BOEM does expect that COPs will address seasonal schedules to avoid disruption of access and enjoyment of coastal recreational resources, as identified by RP REC-1. Odors are a function of air quality. Implementation of RPs AQ-2 through AQ-7 will result in fewer emissions in the offshore and onshore areas affected by the wind projects.

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	included in this environmental review so it is disingenuous to say that onshore construction and nearshore construction won't be scheduled in summer months because those aspects are not considered part of this project (though they should be). While all activities that would adversely impacts our residents should be avoided when they are most included to utilized Town beaches and enjoy their shoreline communities this statement is not reflective of the real- world situation when other providers are actively working in the summer months but it was not considered or an agreement they made to the public. Additionally the noise impacts above lack meaningful analysis of the disruptive nature of the noise and vibration impacts particularly from the pile driving to the local community. There should be a comparison chart or a representative comparative analysis for the noise impacts to a beach goer. Again this analysis should consider not just one NY Bight project but the impacts from cumulative and synergists pile driving of various planned projects and what that will mean to the community. Noise impacts should also be analyzed for the decommissioning process which would likely require heavy construction equipment and machinery for dismantling. The is also a lack of discussion regarding potential odors from all of this heavy equipment and vessel traffic there should be a discussion regarding same to ensure that people going to the beach and enjoying their community are not adversely impacted by any odors that mask the natural nautical smell of the beach and adversely impact their quality of life.	
BOEM-2024-0001-0331-0046	What about airborne noise to us? what will we hear? The turbine manufacturer gives a source level for airborne noise of 118 dB which is loud and noise travels much better over water than over land. We found that the noise at the shore would exceed ambient background levels and therefore be heard. It may also exceed the New Jersey residential night time standard. So here again we have asked our acoustics company to look at this. If we are right let's look at what we are facing here. Hundreds of 1000 foot-tall clearly visible wind turbines the difficulty of watching the blades rotate (I have to turn away) audible noise at the shore reduced wind and waves because the turbines are extracting wind energy we normally get and with that higher local air temperature and humidity. I would suggest that	Thank you for the comment. BOEM expects that—due to distance from shore (closest NY Bight lease area is 20 nautical miles [37 kilometers] from the nearest shoreline)—noise from construction and installation, O&M, and conceptual decommissioning of the WTGs/OSSs could not be heard onshore as sound intensity decreases the further away it gets from the source.

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	this is not just some mild change in the shore going experience but rather its destruction.	
BOEM-2024-0001-0333-0003	We disagree with those who claim that there has been insufficient research on the effects of wind turbines on wildlife, tourism, property values, and human health. Data exists from the decades of wind farm operations in Europe and voluminous data and scientific modeling exists for the Mid-Atlantic marine environment.	Thank you for the comment. Research from all wind development, including European projects, has been considered in this evaluation. In some cases, however, the characteristics of the studied site or the technology were not applicable to the NY Bight environment or the planned projects. Regarding property values, BOEM has added to the Final PEIS Section 3.6.3.4.1 an analysis of the impacts of the NY Bight projects on property values, citing recent studies. BOEM has not found any evidence that offshore wind projects located as far offshore as the NY Bight projects would have any impact on property values.
BOEM-2024-0001-0355-0016	Loss of jobs due to decrease in tourism.	Refer to response to comment BOEM-2024-0001-0355-0020.
BOEM-2024-0001-0355-0020	Destroying our tourism business and a crash of property values. The destruction of tourism would mean many many job losses and businesses closing.	Thank you for the comment. A study conducted to determine the impact of the first offshore wind project off the US coast (3 miles off Block Island) analyzed impacts on tourism through literature reviews and focus groups. The Block Island project is closer to shore and more visible than the projects in NY Bight Area. In general, tourism and recreation were not affected by the construction of the project. Additionally, Airbnb rentals were reviewed to assess impacts on rentals. No noticeable effect on the demand for rentals was found other than an increase during two summer months (BOEM 2018-068).
BOEM-2024-0001-0357-0017	Closer to shore we have the visible impact of the turbines on the prized New Jersey shoreline the disturbing effect of rotating blades that will prevent shore goers from looking out to sea low frequency audible and inaudible noise from turbine operation to humans at the shore which easily penetrates homes causing annoyance and sleep disturbance reduced shore breeze lesser waves and higher air temperature and humidity. Collectively that destroys the shore experience and our cost benefit work indicates that just the visible effect of stationary turbines results in a $6.5 billion loss in tourism revenues over the project lifetime. It also causes a property value (and tax ratable) loss just for shoreline properties of at least $1.3	Refer to response to comment BOEM-2024-0001-0331-0046. Regarding impacts on property values from the visible presence of turbines, BOEM has added to the Final PEIS Section 3.6.3.4.1 an analysis of the impacts of the NY Bight projects on property values, citing recent studies. BOEM has not found any evidence that offshore wind projects located as far offshore as the NY Bight projects would have any impact on property values.

Comment No.	Comment	Response
	billion with implications for other properties. Farther out we do not have this problem.2	
BOEM-2024-0001-0426-0004	Will the siting of turbines ten miles off our coast have an adverse effect on the important tourism industry?	Refer to response to comment BOEM-2024-0001-0355-0020
BOEM-2024-0001-0547-0009	The Project as proposed and situated would turn an essentially quiet recreational community of the New Jersey Shore with areas of pristine shoreline fully protected both by state and federal laws into a fully industrialized area both onshore and off destroying the beauty of the New Jersey Shore's environmentally protected coastline and seriously impair and hamper any viable use for commercial fishing, recreational boating, and water access, destroy all the gains that have been made in preserving and advancing endangered species such as the Right Whale not to mention the dangerous known effects of the operation of the wind turbines on human marine mammal [Footnote 29: "Four whales die in 4 days: Wind farms creating 'death zone' at sea says ex-Greenpeace boss" May 8 2023 (https://nypost.com/2023/05/08/not-unreasonable-to-link-whale-deaths-offshore-wind-farm-work-ex-greenpeace-chief-says/.] and avian and other habitat. This destruction will fully occur by the proposed drilling staging and operation - and cumulative effects as this Project more than doubles the size of the previous project [Footnote 30: Compare BOEM PEIS Docket No. 2023-0030 at 3.6.4-26 (700 turbines less than one and a half times the number of turbines proposed less than one year ago).] - now revealed less than a year later over 1800 skyscraper-size wind turbines by BOEM's own count [Footnote 31: See PEIS at D2-3 D2-4 (number of New Jersey turbines only now totals 1816 more than one and a half times the amount than that proposed a scant nine months ago).]with blades the size of a football field in length - taking together "as many as three offshore wind projects (Atlantic Shores North Ocean Wind 1 and Ocean Wind 2) that could be under construction simultaneously in the New Jersey lease areas" and adding to these the additional six NY Bight projects to give full measure in plain terms of the full impact my fellow Brigantine residents can fully appreciate and that leave us in despair.	Thank you for your comment. Please see responses to comments BOEM-2024-0001-0345-0015 and BOEM-2024-0001-0176-0003 concerning impacts on marine mammals. Cumulative impacts of the three existing projects and the six areas covered by this PEIS will be assessed in the project-specific NEPA documents when project size and location can be more definitively defined and evaluated.

P.5.21 Scenic and Visual Resources

Table P.5-21. Responses to Comments on Scenic and Visual Resources

Comment No.	Comment	Response
BOEM-2024-0001-0122-0006	Visual and Noise Impact: The visual intrusion of large wind turbines and the noise generated by rotating blades is a great concern for residents living near offshore wind farms. These aesthetic and noise considerations will influence the decline of tourism. Impact on Property Values: Studies suggest that the proximity of wind turbines to residential areas will have a negative impact on property values.	Please refer to Section 3.6.9.5, *Impacts of Alternative C (Proposed Action) - Identification of AMMM Measures at the Programmatic Stage.* This section describes changes in seascape, open ocean, and landscape character areas because of visual impacts from WTGs. It also describes which KOPs are anticipated to have visual impacts as a result of the Proposed Action. The NY Bight leases are far from shore (the closest distance is 20 nautical miles [37 kilometers], and the average distance is 32 nautical miles [59 kilometers]), and their individual and collective visibility is greatly reduced (see Table 3.6.9-16, *Magnitude of View Summary*). Section 3.6.8, *Recreation and Tourism*, discusses several recent studies on recreation and tourism benefits and recreation fishing impacts based on the presence of operational WTGs. Section 3.6.3, *Demographics, Employment, and Economics,* discusses potential impacts on demographics, economics, and employment from noise, and information on potential impacts on property values has been added to Section 3.6.3.
BOEM-2024-0001-0224-0003	Visual Impact: The installation of wind turbines in the NY Bight will have a substantial visual impact on the scenic beauty of the region potentially affecting tourism and the overall aesthetic appeal of the area.	Thank you for your comment. The NY Bight leases are far from shore (the closest distance is 20 nautical miles [37 kilometers], and the average distance is 32 nautical miles [59 kilometers]), and their individual and collective visibility is greatly reduced (see Table 3.6.9-16, *Magnitude of View Summary*). The visibility of the WTGs would be variable, depending on current meteorological, moonlight, and sunlight conditions. In views seaward, there would be periods of high, moderate, low, and no visibility. As described in Section 3.6.8.3.2, *Recreation and Tourism – Cumulative Impacts of the No Action Alternative*, and Section 3.6.8.4, *Impacts of Alternative B – Identification of AMMM Measures at the Programmatic Stage*, impacts are anticipated to be minor to minor beneficial. Cumulative impacts of one project or six projects in combination with ongoing and planned activities are expected to be minor to moderate adverse with minor beneficial impacts. Consistent with the impact rating guidance

Comment No.	Comment	Response
		included in Table 3.6.8-2, the main factors informing this impact rating are the expected extent of visual impacts associated with the presence of structures and lighting; impacts on fishing and other recreational activity from noise, vessel traffic, and cable emplacement during construction; and beneficial impacts on fishing from the reef effect.
BOEM-2024-0001-0313-0064	Affected Environment and Environmental Consequences 3.6.9-8 Table 3.6.9-2. Open ocean seascape and landscape conditions category on Designated National State and Local Parks Preserves and Parkways. Comment The table referenced above omits a number of critical Town resources that should be included in the list namely TOBAY Beach (which is only referenced once in the entire document which is concerning in of itself) and TOBAY Sanctuary which is a designated NYS Department of State significant coastal fish wildlife habitat as is South Oyster Bay. Any impacts to same should be evaluated and addressed in the comprehensive environmental analysis for the proposed action inclusive of potential cumulative impacts.	Thank you for your comment. Tobay Beach is approximately 7 miles from KOP-28 Jones Beach (30 miles from OCS-A 0544). Although Tobay Beach is approximately 28 miles from this lease area, it will have similar viewing conditions. KOP-38 Robert Moses Field 5 is another KOP that can be used as a reference condition and is 24 miles from OCS-A 0544. Both KOP-28 Jones Beach and KOP-38 Robert Moses Field 5 are also used in the cumulative analysis. For the COP-level NEPA stage, additional analysis and KOPs will be considered. Impacts on coastal resources are discussed in Section 3.5.4, *Coastal Habitat and Fauna*.
BOEM-2024-0001-0334-0009	VISUALS: Your visual simulations continue to downplay the appearance of the wind farms from the shore. With Ocean Wind you failed to show the appearance from the prime beaches. For Atlantic Shores you show mostly views of seascapes as if shot with a very wide perspective as if shot by a camera with a very wide-angle lens. Though lovely images they hide the reality of the imposing appearance of the turbines by pushing the turbines out far on the horizon. In some cases I understand you have errors in the simulated heights of the turbines. Errors like this are unacceptable. All visuals should honestly show the view of properly sized 1000'+ turbines from the perspective with absolutely correct metrics. You have relied on old opinion surveys to judge the public's reaction to the visual impacts of the wind farms. These surveys were based on old visuals when the turbine sizes were smaller and there were attempts to scale their responses to simulate closer and larger turbines. But this is a poor showing. The visuals that were actually shown to the people are difficult to find. New surveys should be done to accurately capture peoples reaction to updated for people's opinions of the views from images corrected as above. SEE ORIGINAL	Thank you for your comment. The simulations referenced in the comment are from Atlantic Shores Offshore Wind South. Please refer to the simulations created for the NY Bight. Individual lease areas and cumulative simulations are available on the BOEM website: https://www.boem.gov/renewable-energy/state-activities/new-york-bight. Each simulation includes instructions for accurately viewing both printed and digital representations, a panoramic image, and 50-milimeter cropped segments of the overall view for predicted and maximum visibility of both the 850-foot and 1,312-foot WTG heights.

Comment No.	Comment	Response
	COMMENT FOR IMAGE COMPARISSON OF Atlantic City and Brigantine with and without windmills.	
BOEM-2024-0001-0334-0010	This is evidence of the REAL look of 1000' turbines. SEE ORIGINAL COMENT FOR MAP OF Turbines Wind turbines from Atlantic Shores will be as close as 8.7 miles. ocean Wind 2 as close as 10 miles. How can we know for sure how tall 1000ft turbines will look 10 miles out? Here's how: Here is the view from 5th Street and the Boardwalk in ocean City NJ looking north. ocean casino in Atlantic City is the tallest building on the horizon and is about 10 miles away. The distance is verified approximately on the Google map with the distance at 10 scale increments. The casino's height is known 710' tall from documentation available. A wind turbine is superimposed on the photograph at approximately 1000ft tall gauged by the fact that the turbine should be another have as tall as the Ocean casino. The result is how tall a 1000 ft windmill will look from 10 miles away. The red block represents the size of substation superimposed at a size of approximately 300' across and 200' tall relative to the turbine. renditions show the substations much smaller) You can then use your thumb to gauge the height that 1000ft represents at 10 miles anywhere on the horizon as with an adult stretched out arm about the height of the thumbnail is the relative visual height of the turbines. And the math works out too the field of angle of the 1000ft turbine is about" at 2ft from your eye shown in the spreadsheet included. come to ocean City on a clear day and see the scene for yourself and get a good idea how big the turbines will look to YOUR eye.	Thank you for your comment. The simulations referenced in the comment are from Atlantic Shores Offshore Wind South. Please refer to the visual analysis in the PEIS for the NY Bight lease areas and simulations created for the NY Bight. Photo simulations for individual lease areas and cumulative projects in the viewshed are available at BOEM's website: https://www.boem.gov/renewable-energy/state-activities/new-york-bight. Please see the response to this comment for Atlantic Shores Offshore Wind South and the its visual simulation at BOEM's project website: https://www.boem.gov/renewable-energy/state-activities/atlantic-shores-south.
lea	Visual Impacts All energy infrastructure has a visual impact. The choice is between seeing wind turbines miles offshore or continuing to see fossil-fuel fired power plants in the middle of our neighbors. On Long Island our power plants are not only visible but also negatively impact air quality and public health in the community. CCE was very impressed by the visual representations of the individual and cumulative impacts on viewsheds that were displayed at the in-person meetings for the PEIS. They are helpful to understand the realistic visual minimal impacts that are expected. CCE asks that BOEM also compare these visual impacts to the visual impacts from power plants in communities particularly coastal and environmental	Thank you for your comment. Although both the Port Jefferson Barrett and Northport Power stations may be visible from Long Island Sound, they would not be visible from coastal areas with views to the east and southeast. The purpose of the PEIS is to evaluate the potential impacts of proposed offshore energy infrastructure, not existing power plants. Visual impacts would be assessed again as part of the project-specific COP NEPA review for each lease area.

Comment No.	Comment	Response
	justice communities as part of the "No Action" alternative. We can SEE Port Jefferson Barrett and Northport Power stations. We see them from land we them from our boats in the harbors and we see them from the beach. Those that worry that their trip to the beach will somehow be diminished because they see a wind turbine on the horizon need to be reminded they see a power plant on shore on a routine bases.	
BOEM-2024-0001-0355-0010	Views that will be ruined - no longer a beautiful horizon but hundreds of turbines that are 300 feet taller than Ocean Casino.	Thank you for your comment. Please refer to Section 3.6.9.5, *Impacts of Alternative C (Proposed Action) - Identification of AMMM Measures at the Programmatic Stage.* This section describes changes in seascape, open ocean, and landscape character areas as a result of visual impacts from WTGs and which KOPs are anticipated to have visual impacts as a result of the Proposed Action. The NY Bight leases are far from shore (the closest distance is 20 nautical miles [37 kilometers], and the average distance is 32 nautical miles [59 kilometers]), and their individual and collective visibility is greatly reduced (see Table 3.6.9-16, Magnitude of View Summary). With this increased distance and the effects of earth's curvature, the visibility of the WTGs would be 0.12° - 0.28° (0.2-0.5%) vertical field of view at the closest shoreline location in New Jersey for the two WTGs analyzed and 0.27° – 0.48° (0.4-0.8%) vertical field of view at the closest shoreline location in New York. Please see Tables H-3 and H-6. WTG visibility would be variable, depending on current meteorological, moonlight, and sunlight conditions. In views seaward, there would be periods of high, moderate, low, and no visibility.
BOEM-2024-0001-0355-0049	Studies show properties near elevated high voltage power lines sell for up to 44 percent less and within 1000 feet sell for less than 17 percent. This effect can be much more dramatic and destroy property values of homes currently with beach views that will also be ruined by the visual impairment of the wind turbines and the noises they make.	See response to comment BOEM-2024-0001-0122-0006.
BOEM-2024-0001-0357-0044	With respect to the project's impact on the State's coastal zone and its conflicts with the visual resource protection elements of the States coastal zone management rules 1. Limits on the total project nameplate capacity to allow flexibility in turbine size and number 2.	Thank you for your comment. The six leases analyzed in the PEIS are between 20 nautical miles (37 kilometers) and 41 nautical miles (76 kilometers) offshore. Two wind turbine heights are analyzed: 1,312 feet (400 meters) and 853 feet (260 meters) to

Comment No.	Comment	Response
	A turbine exclusion zone from all beach points on Long Beach Island of 17.2 miles consistent with what the BOEM has agreed to provide for New York State 3. The use of smaller turbines for those closer to shore to reduce visible impact and 4. Spacing turbines at least two nautical miles apart to reduce visible impact.	rotor blade tip above High Astronomical Tide. The visual simulations used to support the visual analysis assessed WTGs based on grid spacing of 0.6 by 0.6 nautical miles (1.1 by 1.1 kilometer) for purposes of a maximum case analysis, which exceeds the 1,103 WTGs allowed in the RPDE. Therefore, the potential number of WTGs visible from any KOP as reported in this analysis likely overestimates impacts. Consistency with state coastal zone management rules will be evaluated on a project-specific basis following the lessee's submittal of its COP.
BOEM-2024-0001-0310m	Just stop making wide angle panoramic views that pushes the horizon out so that the turbines get reduced to tiny little things. The human eye they're big. We know they're big because the turbines that will be ten miles away, which there are several sites of that, they are taller than what we see Ocean Casino from Ocean City and it's quite prominent on our shore on our visual thing. So these will be a third taller than Ocean Wind and Ocean Wind itself is already pretty big. So you fail that. Maybe you can do a better job.	Thank you for your comment. The NY Bight leases are far from shore (the closest distance is 20 nautical miles [23.6 miles], and the average distance is 32 nautical miles [36.4 miles]), reducing their individual and collective visibility. See Table 3.6.9-16, *Magnitude of View Summary*. With this increased distance and the effects of earth's curvature, the visibility of the WTGs would be 0.12°–0.28° (0.2%–0.5%) vertical field of view at the closest shoreline location in New Jersey for the two WTGs analyzed and 0.27°–0.48° (0.4%–0.8%) vertical field of view at the closest shoreline location in New York. Please see Tables H-3 and H-6. WTG visibility would be variable, depending on current meteorological, moonlight, and sunlight conditions. In views seaward, there would be periods of high, moderate, low, and no visibility. Please also refer to the simulations created for the NY Bight. Individual lease areas and cumulative simulations are available on the BOEM website: https://www.boem.gov/renewable-energy/state-activities/new-york-bight. Each simulation includes instructions for accurately viewing both printed and digital representations, a panoramic image, and 50-millimeter cropped segments of the overall view for predicted and maximum visibility of both the 850-foot and 1,312-foot WTG heights.
BOEM-2024-0001-0529gg	Also, some people complaining about the viewership. Well, I think we should again just suppose, in the PEIS, the view of the power plants we can see. We can see our fossil fuel power plants, they're not invisible. And yes, we may be able to see one or two of the turbines offshore, but that's nothing compared to the power plants	Thank you for your comment. The purpose of the PEIS is to evaluate the potential impacts of proposed offshore energy infrastructure, not existing power plants. Visual impacts would be

Comment No.	Comment	Response
	that not only we can see but are spewing out nitroxide, sulfur dioxide, into the air around our communities.	assessed again as part of the project-specific COP NEPA review for each lease area.

P.5.22 Project Design Envelope

Table P.5-22. Responses to Comments on Project Design Envelope

Comment No.	Comment	Response
BOEM-2024-0001-0181-0004	Ecological design elements should be incorporated into the offshore wind infrastructure where benthic habitat could be maximized. Using nature-based design elements significantly increases species settlement richness and abundance. Nature-based design elements and nature-based features allow structures to actively provide carbon sequestration while decreasing the magnitude and frequency of maintenance and increasing structural lifespan. Specifically using ecological concrete as a mitigation measure and design alternative supports compliance with strict environmental regulations. The term "ecological concrete" refers to an alternative to traditional concrete where material composition enhances or encourages the growth of flora or fauna when placed in the marine environment. Ecological concrete may include recycled materials such as recycled or reclaimed concrete resulting in reduced greenhouse gas emissions as compared to traditional concrete.	Thank you for your comment. BOEM included RP MUL-12 (refer to Appendix G) in the Final PEIS, which encourages lessees to use nature-inclusive design products in their projects.
BOEM-2024-0001-0181-0006	Given the aforementioned details above all concrete materials including all cable and scour protection utilized in the wind energy development of the six New York Bight projects should solely be fabricated from ecological concrete. Ecological concrete can meet project goals by minimizing negligible impacts creating marine habitat opportunities and providing a bioprotection layer that hardens and reinforces the structure through species settlement. Moreover to mitigate the impacts of habitat conversion from scour and cable protection the NY Bight projects should utilize natural or engineered rounded stone with a consistent grain size thus mirroring natural seafloor substrates. Any exposed surface layer should also be meticulously designed and selected to promote three-dimensional structural complexity creating a diversity of crevice sizes (e.g. mixed	Thank you for your comment. BOEM included RP MUL-12 (refer to Appendix G) in the Final PEIS, which encourages lessees to use nature-inclusive design products in their projects.

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	stone sizes) and rounded edges (e.g. tumbled stone). Such characteristics should be sloped such that the outer edges match the natural grade of the seafloor. When using concrete mattresses and scour protection bioactive concrete (i.e. with bio-enhancing admixtures) should be used as the primary scour protection or veneer to support biotic growth	
BOEM-2024-0001-0313-0009	Chapter 2 Alternatives 2.1.2.1 One Project SEE ORIGINAL COMMENT FOR TABLE 2-2. RPDE parameters for one representative NY Bight project Comment - It is unclear from the table above and the discussion in the PEIS if the layout and grid spacing will be different based on the various scenarios for turbine height (721-11312 ft.) and turbine rotator diameter (721-1214 ft.). It would be helpful if there was a representative diagram of the layout and spacing proposed to give a visual representation of the anticipated WTGs and OSSs. There is also a significant difference in the WTG seabed footprint proposed for monopile (0.24 acres) as compared to 2.88 acres which would appear to necessitate a commensurate environmental impact analysis associated with these disparities which must be addressed in greater detail. Similar concerns exist regarding the offshore substations (OSSs) export cables barrier depth and other project elements continued on the next page in this chart. It is impossible to provide meaningful comments on the wide-ranging potential impacts with such wildly ranging parameters per project design element. SEE ORIGINAL COMMENT FOR TABLE of Element Project Design Element Typical Range	The RPDE for the PEIS includes a range of representative parameters of offshore wind development in the NY Bight, as described in Section 2.1.2.1. The RPDE is not prescriptive; therefore, BOEM does not stipulate which combination of parameters would likely be developed but rather analyzes the maximum effects for the range of parameters given, including the spacing and height of turbines. Each COP submitted within the NY Bight will be required to identify the proposed spacing, turbine height, rotor diameter, and other parameters of the project. Regarding the wide range of parameters, the RPDE was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. Because the RPDE covers six lease areas of differing sizes and was developed before lessees submitted their COPs, a wide range of potential parameters was used to ensure the maximum potential impacts from development in the NY Bight could be assessed.
BOEM-2024-0001-0313-0013	2.1.2.1.1 Construction and Installation Page 2-5 states "Proposed onshore elements of one NY Bight project include export cable landfall sites sea-to-shore transition onshore export cable routes onshore substation or converter station and connection to a point of interconnection (POI) (Figure 2-1). Because the analysis in this Draft PEIS was prepared before any of the NY Bight COPs were submitted by lessees actual locations of landfall locations and onshore facilities are unknown at this time. Because the location of landfalls and onshore facilities are unknown this Draft PEIS describes the types of impacts from construction and operation of onshore components generally and largely defers the analysis of	As described in Section 1.1, *Overview*, BOEM regulations 30 CFR 585.620 require that lessees submit a COP for proposed projects. The requirement for a COP is not derived from the PEIS, and COPs must be submitted regardless of BOEM's decision relative to the PEIS. The COPs are required to comprehensively describe construction and installation, O&M, and conceptual decommissioning of the project offshore and onshore. Following receipt and acceptance of a COP, BOEM will conduct a NEPA review on that COP.

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	onshore components to the COP-specific NEPA documents. It should also be noted that onshore elements are included in BOEM's analysis in the Draft PEIS to support the evaluation of a complete project and for future tiering; however BOEM's authority under OCSLA extends only to the activities on the OCS." Comment - Since local impacts are contingent on project specifics that are purportedly unknown at this time according to the above paragraph the Town respectfully requests that a site-specific COP is prepared for all 6 projects. As points of interconnection may have the potential to impact the Town of Oyster Bay especially in terms of larger plan of scale (substations and associated infrastructure for example) this information is crucial for analysis. It would appear that OCS-A-0544 would have the greatest potential to impact the Town as it is in the closest in proximity to the Town shoreline; however it is possible that infrastructure may be shared not only as it pertains to the NY Bight projects but also with other planned offshore developments; thus the information should be provided and evaluated in the final PEIS as part of the cumulative impact analysis. It is unclear from the PEIS what the decision matrix and parameters are for requiring a COP only that it is under the authority of BOEM. In an abundance of transparency this process should also be disclosed during the environmental review process for determining which projects will be evaluated.	
BOEM-2024-0001-0313-0017	Page 2-6 States "From the landfall location onshore export cables would carry the electricity to the onshore substations or converter stations (Figure 2-1). Onshore export cables are typically buried in a trench and would typically follow existing rights-of-way where possible. The onshore substations transform and prepare the power received from the export cables to be connected into the existing grid at the POI. Projects with large nameplate capacity or that include long transmission lines carrying very large power capacities may choose to use HVDC instead of HVAC. If HVDC is used an onshore HVDC converter station would be necessary to convert power from the onshore export cables to HVAC to allow interconnection to the existing transmission infrastructure. Typically either an overhead connection or an underground transmission line with an overhead tie-line may be used from the onshore	The RPDE in the PEIS was developed before lessees submitted COPs for BOEM review; therefore, the POIs listed in Section 2.1.2.1.1, *Construction and Installation*, are included only as examples of locations where lessees may choose to interconnect and develop onshore infrastructure. The locations of POIs proposed for each NY Bight project must be identified in the COP, which BOEM will then analyze in a project-specific NEPA document.

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	substation/converter station to a POI at a nearby facility. The transmission POI is the location where the power generated by the offshore wind project is connected into the existing electrical grid. This can be done at new facilities constructed for the project or at existing facilities that have been modified to accommodate the interconnection of the offshore wind project. Examples of potential POIs in New York and New Jersey that could be used by the NY Bight projects are listed below. Other POIs may ultimately be chosen by the NY Bight lessees. Potential configurations of transmission grid interconnections between the NY Bight projects and the POIs are described in the Transmission Interconnection Configurations subsection. Examples of potential POIs for the NY Bight projects: New York - Rainey Ruland Road Gowanus East Garden City Freshkills Port Jefferson Farragut Shore Road Newbridge Road Syosset Northport West 49th Street Mott Haven Brookhaven" Comment There is no additional information on the potential points of interconnection in the PEIS; as a number of the identified locations are within the Town of Oyster Bay specific details of these POIs must be disclosed ad be available for public review and comment. Furthermore it would be reasonable to assume that even if the POIs are not in Oyster Bay there is associated infrastructure to storage and distribution facilities that is part of a larger plan of scale that is of significant concern to the Town. It is also unclear why this information is not known at this time. When reviewing the order of operations on the critical path towards construction for the Empire Wind project for example siting and construction of the onshore substations is one of the first items on the sequence schedule. Therefore it would stand to reason that this information is readily available or at least available for disclosure and review in the PEIS. Fore reference this is the schedule in the COP for Empire Wind: SEE ORIGINAL COMMENT FOR TABLE Empire Offshore Wind Empire Wind Project (EW1 and EW2)	
BOEM-2024-0001-0313-0025	2.1.2.1.3 Conceptual Decommissioning Page 2-15 states "Conceptual decommissioning of a NY Bight project would be required in accordance with 30 CFR 285. Under 30 CFR 285 NY Bight lessees would be required to remove or decommission all facilities projects cables pipelines and obstructions and clear the	Section 2.1.2.1.3, *Conceptual Decommissioning*, summarizes the requirements (defined in 30 CFR 285) and typical process for decommissioning an offshore wind farm, and each Chapter 3 resource section describes the general impacts that could occur from decommissioning activity. Further detail on

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	seabed of all obstructions created. Absent permission from the Bureau of Safety and Environmental Enforcement (BSEE) all projects would have to achieve complete decommissioning within 2 years of termination of the lease and either reuse recycle or responsibly dispose of all materials removed." Comment The information on decommissioning seems very surficial and triggers concerns that should be addressed. Is there a bond/escrow account required if the company defaults on lease obligations not just during decommissioning but if there are issues during construction and operation. Two years does not seem like enough time before the expiration of the lease especially when plans need to be reviewed and there are multiple approvals and considerations. There should be meaningful technical analysis in the environmental review process of considerations and alternatives such as abandoning some structures in place the impacts of the disturbance of removing not just the WTGs OSSs and infrastructure. All construction impacts should also be provided in the analysis such as the air quality impacts. GHG emissions from decommissioning transportation impacts to recycling disposal facilities and the number of trips the emissions associated with reprocessing/disposal upon expiration of the useful life of these structures all of the construction equipment and vessel emissions as well as the impacts to air land and water quality of the disposal sites which are not discussed in any detailed way in the PEIS. Where will these materials be disposed or recycled? What are those impacts. These are all integral components of the whole action and also do not seem to be considerations when calculating net emissions. ("Conceptual decommissioning would involve vessels and equipment similar to those used for construction and impacts of conceptual decommissioning are expected to be similar to the impacts of construction." Page 3.4.1-9) The reverse engineering seems like an oversimplification without any substantiation and therefore may not be providing accurate analysis of associated impacts when comparing construction and the decommissioning processes. The PEIS simply assumes the process for dismantling and decommissions will be the reverse of installation but this again requires in depth analysis and discussions regarding where will dismantling take place what are the noise impacts what are the	decommissioning would be described in the COP and will be analyzed in each COP-specific NEPA analysis. As required by 30 CFR 285, a decommissioning application would be required prior to decommissioning activity taking place, which would include additional information on the decommissioning process for each NY Bight project. If a COP is approved, each applicant would have to submit a bond (or another form of financial assurance) prior to installation that would be held by the U.S. government to cover the cost of decommissioning the entire facility in the event that the applicant would not be able to decommission the facility.

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	protections in place for turbidity control and mitigation what are the water quality impacts what facilities are planned for accepting debris of this nature how will the materials be transported will new structures for replacements be transported to a storage/staging area how will this logistically occur? How will this impact local communities to be in a state of revolving and construction?	
BOEM-2024-0001-0313-0041	3.5.2.1 Description of the Affected Environment and Future Baseline Conditions The PEIS states "The NY Bight is an offshore area extending from Montauk Point on the eastern side of Long Island New York southwest to Cape May New Jersey. Because the potential cable routes are unknown at this time the benthic resources affected environment characterization covers inshore resources up to the shoreline within the NY Bight." Comment It would appear that due to the expedited timelines and rush towards construction that more information is known about cable routes than is being disclosed and analyzed in the environmental review documents. The PEIS should be updated with information on interconnection point and cables routes and onshore substations. Further if this information is deferred to the COP again DER would request that a COP be prepared for OCS-A 0544s specifically and any other projects in the NY Bight that share infrastructure that would connect and traverse Town lands and potentially impact the Town.	The RPDE in the PEIS was developed before lessees submitted COPs for BOEM review; therefore, the POIs (and potential cable routes to those POIs) listed in Section 2.1.2.1.1, *Construction and Installation*, are included only as examples of locations where lessees may choose to interconnect, route cables, and develop onshore infrastructure. The locations of POIs proposed for each NY Bight project must be identified in the COP, which BOEM will then analyze in a project-specific NEPA document. BOEM regulations 30 CFR 585.620 require lessees submit COPs for each proposed project.
BOEM-2024-0001-0313-0060	3.6.7.1.4 Cables and Pipelines The "EIS states "There are 27 cables (18 active and 9 out of service) offshore within the NY Bight geographic analysis area (Figure 3.6.7-5) (NASCA 2020). The potential for overlap of submarine cables in the geographic analysis area will be evaluated during the future COP NEPA stage. The NYSERDA developed an Offshore Wind Cable Corridor Constraints Assessment to identify the constraints of developing future offshore wind cables in New York State Waters at landfall and along overland routes to existing POIs (NYSERDA 2023). NYSERDA identified POIs for offshore wind projects to interconnect to the existing New York State transmission grid. Table 3.6.7-1 lists the potential POIs in New York identified in the Offshore Wind Cable Corridor Constraints Assessment. No comparable study has been	As described in Chapter 1, the PEIS presents a programmatic analysis of development of the six NY Bight lease areas and mitigation measures to mitigate those impacts; it will not result in the approval of activities. Each lessee is required to submit a COP that will include project-specific information that will be analyzed in detail in a separate, COP-specific NEPA document. Potential POIs in both New York and New Jersey are identified in Section 2.1.2.1.1, but the specific locations of each POI to be used by the NY Bight projects is not known. Therefore, the analysis of the offshore export cables and onshore infrastructure in the PEIS is regional in nature; site-specific analysis is deferred to the COP-specific NEPA analysis. When BOEM analyzes the COPs, it will

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	conducted by the State of New Jersey." SEE ORIGINAL COMMENT FOR TABLE 3.6.7-1 Onshore POIs Comment Although DER believes this constitutes an impermissibly segmented environmental review all information regarding points of interconnection in the Town of Oyster Bay and potential impacts must be disclosed and analyzed at the earliest possible stages. Where information is not speculative and is readily available all sections of the PEIS should be updated for consistency and accuracy regarding the full range of potential impacts on the larger plan of scale pertaining to provide the requisite environmental review of the whole action.	analyze them separately, as each project has independent utility (i.e., one project does not require another project to operate).
BOEM-2024-0001-0322-0003	However we have concerns about offshore export cable burial depth. The PEIS says that these cables will be buried a minimum of 3 feet deep where technically feasible. Regulations require that undersea cables must be buried at least 15 feet when crossing navigation channels. This requirement should extend to navigation safety fairways as they will be the most highly concentrated traffic areas along our coasts. If a vessel must drop anchor in an emergency situation vessel operators want to eliminate the likelihood of damaging a power cable. Burying the cables at least 15 feet deep is the best practice to avoid such a scenario. BOEM should require the project developers to bury the offshore export cables 15 feet where they cross the navigation safety fairway.	As described in Section 2.1.2.1, *One Project*, the RPDE provides a range of parameters for analysis, including cable burial depth. The parameters are not prescriptive. Table 2-2 notes that cable burial depth may vary based on site-specific factors, including navigation channels, and federal civil work channels. Because offshore export cables routes are not known for each NY Bight project at this programmatic stage, the impacts of cable crossings of specific features, such as navigation safety fairway, cannot be analyzed at this time. During the COP-specific NEPA analysis, there will be an opportunity for BOEM to consider additional alternatives and mitigation measures to minimize impacts related to cable burial depth.
BOEM-2024-0001-0331-0031	Again going back to the purpose of the project which is to produce electric power not to just install structures the PEIS must present operational data. Offshore wind is an intermittent energy source. With typically reported capacity factors of about 40 percent a wind turbine only operates for an equivalent 146 days a year so an understanding of the "downtime" needed for maintenance and repairs is needed to determine the benefit of the project and contrast that with its environmental impact. Therefore the PEIS should have included an analysis of failure modes their frequency repair methods and time needed and the expected environmental impacts of doing those repairs. The companies must have this information and it should be disclosed. The overall loss of operating time on the wind complex should be stated. In addition it should say what will be done with a turbine that cannot be repaired. Will it	Section 2.1.2.1.2, *Operations and Maintenance*, describes typical O&M activities that would occur during the operation of an offshore wind farm. Section 2.3, *Non-Routine Activities and Events*, describes events that may occur but are not possible to predict with any degree of certainty, including corrective maintenance activity in the event of damage or failure of a wind farm component. These maintenance actions are considered in the analysis of impacts in Chapter 3. Additional detail on the anticipated timing and frequency of maintenance and repair work would be provided in each COP, but estimates of how “downtime” would affect the power output of a project compared to its environmental impacts is beyond the scope of BOEM’s NEPA review. NEPA does not require a cost-benefit analysis, and BOEM’s NEPA analysis appropriately considers and

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	remain there for the duration of the lease or will it be decommissioned early? The failure rates for smaller turbines2 to 4-megawatt show that 50 percent of those turbines undergo a major repair or replacement each year. That could involve a substantial downtime to diagnose the problem secure parts and make the repair which could significantly affect the capacity factor and the power production. The nature of the repair could also be important in terms of environmental impact in terms of additional vessel traffic and failures involving oil leakage so the nature and environmental impact of such repairs needs to be presented. Such an analysis and mitigation measures should be presented for both the turbines and the transmission cables. It is our understanding that the project will use new very high voltage lines not previously tested under actual conditions. A failure of an export cable could have a dramatic impact on annual power production. The PEIS should present the expected failure modes and explain how the problem will be isolated and repaired along with the expected downtime.	quantifies the benefits from offshore wind projects, such as avoided emissions, and adverse impacts, such as air emissions during construction. Section 2.1.2.1.3, *Conceptual Decommissioning*, summarizes the requirements and typical process for decommissioning an offshore wind farm. As noted, all facilities would need to be removed within 2 years of the termination of the lease.
BOEM-2024-0001-0333-0001	The New Jersey Environmental Lobby believes that this PEIS is an acceptable framework for the projects in the lease areas. One suggestion that NJEL would offer is in reference to decommissioning. Since experience with windfarms shows that turbine foundations become reefs for fish populations we suggest that there is flexibility in requirements for removal of infrastructure so that decades hence alternatives are evaluated for their impact on wildlife in the surrounding environment and for stakeholders in the fishing sector.	Section 2.1.2.1.3, *Conceptual Decommissioning*, summarizes the regulatory requirements and typical process for decommissioning an offshore wind farm.
BOEM-2024-0001-0334-0012	DECOMMISSIONING: The public would be best served by BOEM insuring that decommissioning is assumed to be a full removal of the installed wind farm. And it should be mandatory that a project bond/escrow the full estimated cost of removal before building the project is approved.	Section 2.1.2.1.3, *Conceptual Decommissioning*, summarizes the regulatory requirements and typical process for decommissioning an offshore wind farm.
BOEM-2024-0001-0352-0004	We appreciate that the draft PEIS notes which AMMM measures have been previously applied as Constructions and Operations Plan (COP) terms and conditions. The final PEIS should be updated to reflect all COPs that have been approved up until that point and should list the relevant COPs. Also we understand that BOEM is not accepting COPs for projects in these lease areas while the PEIS is under development. Any adopted programmatic AMMM measures	Attachment D1 in Appendix D, *Planned Activities Scenario*, lists all ongoing and planned offshore wind activities on the Atlantic coast that are considered in the PEIS and the status of those projects, including whether a COP has been submitted or approved for a particular lease area. The appendix has been revised for the Final PEIS with updated status of projects.

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	should be described in the COPs as actions that will be taken. Additional measures that are not programmatic AMMM measures should be presented separately in the COPs and project specific NEPA documents.	It should be noted that BOEM is accepting COPs for projects in the NY Bight lease areas but does not expect to start NEPA analysis on those COPs until the PEIS is complete, if the lessee indicates it would like to rely on the PEIS. Additional mitigation measures can be proposed by the lessee or by BOEM at the COP-specific NEPA stage for each individual project.
BOEM-2024-0001-0354-0011	The currently proposed de-commissioning plan is deficient in its lack of lasting safeguards monitoring procedures bonding requirements or the required posting of monies/guarantees or relevant safeguards to provide environmental protections in perpetuity as to such massive industrial construction proposed to be placed in a prime hurricane/northeast storm zone. Based upon my understanding of conversations I had with BOEM officials at the Toms River New Jersey February 8 2024 informational meeting I learned that BOEM usually does not devote any comprehensive focus upon de-commissioning issues during the draft Environmental Impact Statement stage of review. I also learned BOEM has experience in reviewing procedures and the implementation of safeguards and monitoring techniques as to de-commissioning _issues associated with land based (emphasis added) wind turbine projects. With respect to. ocean based (emphasis added) proposals BOEM is essentially learning as it goes along as to such ocean projects with what might be labeled to be good faith trial and error process. BOEM officials might be quick to criticize any such characterization as being over simplistic. Nevertheless it is clear that there is no base line of studies in existence or of a comprehensive record of a decision making process with appropriate monitoring techniques and safeguards concerning any significant ocean wind turbine project. The basis of such an uncontroverted fact concerns the lack of history of any such projects being in existence as to the ocean for any significant time frame for study. Additionally European models of wind turbines not located in a prime North_ Atlantic hurricane and northeast storm zones do not provide a transferrable applicable body of knowledge and history. Further the actual shelf life of wind turbines with their non-biodegradable blades supports a conclusion that de-commissioning would be necessary as early as 1O to 20 years after construction even assuming that a particular wind turbine was	Section 2.1.2.1.3, *Conceptual Decommissioning*, summarizes the regulatory requirements and typical process for decommissioning an offshore wind farm. Further detail on decommissioning would be described in the COP and will be analyzed in each COP-specific NEPA analysis. As required by 30 CFR 285, a decommissioning application would be required prior to decommissioning activity taking place, which would include additional information on the decommissioning process for each NY Bight project. If a COP is approved, each applicant would have to submit a bond (or another form of financial assurance) prior to installation that would be held by the U.S. government to cover the cost of decommissioning the entire facility in the event that the applicant would not be able to decommission the facility.

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	not rendered irretrievable or destroyed by storm events. Simply put it is imperative to create an enforceable realistic determination of safeguards and monitoring techniques at the onset of the wind turbine project approval process.	
BOEM-2024-0001-0354-0012	Related to the above arguments I would hereby respectfully note that once a bureaucracy and its officials and employees have all become invested into a process and concept such a commitment becomes a self-fulfilling prophecy. As such it would be exceedingly difficult if not virtually impossible to support or to stop any approval process of such massive wind turbine projects if decommissioning issues are left to be addressed in the end stages of the approval process or even at a midway point. Related critical concerns as to de-commissioning if indeed the process is even possible must be addressed now. Simple approvals before local planning boards invariably require an applicant/developer to post a bond as a safeguard to make sure a project is completed in a safe and final manner as per approvals. Such a concept should be applied to the industrialization of the ocean through wind turbine construction as contemplated. This assumes for the sake of argument BOEM proceeds down a path which many commentators have described as being purposely too fast and far too much as to the numbers of approvals sought.	Refer to response to comment BOEM-2024-0001-0354-0011.
BOEM-2024-0001-0354-0013	Consideration should also be given that potentially all of the wind turbine project applicants to date have been partially or totally owned by foreign corporate entities. Risks associated with bankruptcy abandonment of the project during construction or preconstruction stage and related financial issues have already occurred with respect to wind turbine projects already approved. At the very least if BOEM considers moving forward with the current NY Bight project requirement for a nonrefundable posting of funds or nonredeemable insurance coverage must be enacted even at the draft EIS stage of the process. It is fundamentally unfair for citizens environmental groups fishing interests or interested concerned citizens to have to consider filing their own enforcement actions related to de-commissioning. It is highly doubtful that foreign jurisdictions or even the International Court at the Hague would entertain any such filings or claims for relief in a timely and realistic	Refer to response to comment BOEM-2024-0001-0354-0011 regarding the requirements for decommissioning and bonds. NEPA does not require a cost-benefit analysis, and BOEM's NEPA analysis appropriately considers and quantifies the benefits from offshore wind projects, such as avoided emissions, as well as adverse impacts, such as air emissions during construction.

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	manner. A final related issue concerns unaddressed needs for a realistic cost benefit analysis and a computation of ascertainable losses or damages all of which must be included as a safeguard in the de-commissioning process. Clearly similar insurance requirements or other monitoring techniques applied to United States Courts jurisdictions for land-based wind turbine projects in all likelihood serve as a very limited if not useless model to be applied to the de-commissioning international process at hand. The record is entirely deficient to date as realistic enforceable adequate (if indeed achieving "adequacy" with an appropriate level of damages is even possible) safeguards have not been addressed.	
BOEM-2024-0001-0357-0055	Decommissioning- Cumulative and Long-Term The removal of the wind turbines at the end of their useful life is by no means assured. Current decommissioning rules allow the federal agency the Bureau of Ocean Energy Management (BOEM) to leave them in place or have then toppled them in place. Collection of funding during turbine operation can be deferred based on a company's financial strength. The technical feasibility of cutting and removing these huge turbines and a section of the 50-foot diameter monopile foundation with a 6 inch thick steel shell has not been presented. Beyond that step the logistics involved are staggering. The availability of the limited number of wind turbine installation vessels used to install turbines to be detoured here and remain on site for long periods while foundations and towers are cut and to remove them is highly doubtful. So is the availability of onshore facilities to cut and disassemble them into manageable sections. The mass of steel to be cut in say 15 turbine towers and foundation sections is comparable to that of a Navy aircraft carrier which can take over a year to disassemble. Cutting and disposal sites for the blades have not been identified. Finally unlike a turbine operational setting where a cease operations order would cause a financial penalty no such incentive exists here for the company to do the work since the turbines have already been shut down. Also the BOEM does not have a stellar track record with regard to other decommissioning efforts. A General Accountability Office report found that it collected only eight percent of the revenues needed to do the necessary decommissioning of oil and gas facilities in the Gulf of Mexico. It also found that ninety-	Refer to response to comment BOEM-2024-0001-0354-0011.

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	seven percent of the seabed pipelines have been left in place. This begins to look like an enormous undertaking that the country is not prepared for. Its more likely that the turbines will not be removed but rather left in place with the blades removed or toppled in place and left on the seabed. This raises the spectre of prolonged and perhaps permanent navigation hazards visual degradation of the seascape and loss of hundreds of thousands of acres of productive marine territory that should be considered now in this program EIS and measures to avoid that presented. Alternatively the states and/or the federal government may have to arrange for and pay for the removals and processing at substantial detriment to other services they provide.	
BOEM-2024-0001-0368-0002	The most shocking fact that I learned at the public meeting was that of the turbines themselves. I've read that in some countries diesel engines are added to the turbines to keep them from icing in extreme cold. I don't know that this is a fact so I made a point to inquire about the offshore turbines that may be installed off our coast. Amazingly I learned that BOEM does NOT CONCERN itself of the actual turbines! To me this is absolutely insane for an environmental impact study to not consider the actual objects involved in the wind projects. What is inside these mammoth machines? Obviously as they are mechanical they will be lubricated. How much lubricant? One gallon? A hundred gallons? How will spills be contained when they happen? Is there other environmental impacts? Vibrations in the water or the sea floor? Bird strikes? Fuel and fuel spills? Your ignorance of the design and construction of the wind turbines to be installed is simply pathetic and appalling. The public needs to be informed of this immediately. It is only reasonable to assume that there will be a thorough examination of these machines and an assessment of their impact to the ocean and marine life not to mention the effects of debris and chemicals that may ultimately wash up on shore and come into contact with people either externally or internally.	The PEIS, as well as other offshore wind NEPA documents being prepared by BOEM, analyzes the anticipated effects of the construction, operation, maintenance, and decommissioning of offshore wind projects, including impacts from the turbines themselves. For example, Section 3.4.2, *Water Quality*, analyzes the effects from accidental releases of oils, lubricants, and other fluids from the turbines, and Appendix D, *Planned Activities Scenario*, estimates how much of these fluids are installed in WTGs in the geographic analysis area (refer to Table D2-3). Impacts on biological resources from sound and vibration of an operating WTG are analyzed in Sections 3.5.5, 3.5.6, and 3.5.7. Impacts on birds from operating WTGs are analyzed in Section 3.5.3.
BOEM-2024-0001-0383-0002	PDE: The Project Design Element ranges in the Draft PEIS are so ridiculously broad that they prohibit any meaningful assessment or analysis. How can BOEM analyze a range of 50-280 turbines? It cannot. The impact of 50 turbines is certainly not the same as the	As described in Section 2.1.2.1, the RPDE in the PEIS was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey, and it was prepared before

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	impact of over 5.5 times that many turbines. One OSS is not the same as 5 OSS; depending on the type used the scour protection can be 0.51 acres for one monopile OSS to over 40 acres of scour protection for 5 jacket foundation OSS. This is not comparable enough to include in a single PDE. An interarray cable length of 33 miles is not remotely close to an interarray cable length of 550 miles. A range of 1-9 export cables with an estimated cable export length of 30 or 929 miles is not the same- 929 miles of cables is over 30 times more cable than 30 miles of cable! BOEM cannot have a PDE that encompasses impacts from one element that vary by 30 times in intensity. These huge ranges presented by the PDE deliberately leave all analysis or comparisons meaningless. What is truly remarkable is that these ranges apply to only one "representative" project! [Footnote 5: PEIS at https://www.boem.gov/sites/default/files/documents/renewable-energy/_NY%20Bight_DraftPEIS_Vol1_Chapters1-4_January2024_508.pdf p. ES-6 7.] When multiplied by 6 the range of impacts becomes even more ridiculously broad and meaningless. Due to such meaningless comparisons owing from the huge ranges of single project size included in the PEIS never mind the extrapolation of these ranges to multiple projects BOEM should either refine the PEIS to include a much narrower PDE or throw out the entire PEIS altogether. However, BOEM subsequently states "For the analysis of six NY Bight projects BOEM anticipates development of 1103 wind turbine generators (WTGs) 22 offshore substations (OSSs) 44 offshore export cables totaling 1772 miles (2852 kilometers) and 1582 miles (2546 kilometers) of interarray cables across the six NY Bight lease areas." [Footnote 6: Ibid p. ES-7.] If BOEM's PDE for one project estimates up to 929 miles of export cables for a single project it is unclear how it can expect to have 44 offshore export cables totaling 1772 miles for six projects unless BOEM already has COPs in hand that it has not made publicly available which makes the PEIS itself a useless document. If this is the case BOEM should cease work on the PEIS and make the COPs public working from genuine documents in a transparent manner rather than waste the public's time with obsolete initiatives. BOEM cannot require public comment on	lessees submitted COPs for BOEM review. The RPDE includes a range of representative parameters of offshore wind development in the NY Bight. The RPDE contains a minimum and maximum value for most parameters or multiple options that could be selected to provide bounds for the analysis. Because the RPDE covers six lease areas of differing sizes and was developed before lessees submitted their COPs, a wide range of potential parameters was used to ensure the maximum potential impacts from development in the NY Bight could be assessed. Regarding the parameters for six NY Bight lease areas, as noted in Section 2.1.2.2, the values for these parameters were provided by the NY Bight lessees or were calculated by BOEM based upon information provided by the lessees and represent the maximum number/length of WTGs, OSSs, and cables that would be developed for the six NY Bight projects. The six project parameter values were not calculated by multiplying the one project RPDE by six because this method would have significantly overestimated number/size of project features, as the one project RPDE is based on the maximum value for all six of the NY Bight lease areas (i.e., largest project, largest lease area).

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	something it knows is inaccurate or non-representative of projects under consideration.	
BOEM-2024-0001-0383-0013	High resolution geophysical surveys: The PEIS discusses under its description of one representative project that "Prior to installation pre-construction surveys such as geophysical and geotechnical (G&G) or high-resolution geophysical (HRG) surveys may be needed to refine the design." [Footnote 33: See PEIS at https://www.boem.gov/sites/default/files/documents/renewable-energy/_NY%20Bight_DraftPEIS_Vol1_Chapters1-4_January2024_508.pdf p. 2-9.] However these types surveys are already ongoing approved by the EA for the New York Bight leases. [Footnote 34: See Commercial and Research Wind Lease and Grant Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf of the New York Bight Draft Environmental Assessment (boem.gov) and Commercial and Research Wind Lease and Grant Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf of the New York Bight (boem.gov)] BOEM issued a Finding of no Significant Impact for this EA and the related approved survey activities. [Footnote 35: See BOEM Completes Environmental Review of Offshore Wind Leasing in the New York Bight | Bureau of Ocean Energy Management and Commercial and Research Wind Lease and Grant Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf of the New York Bight (boem.gov) .]But it does not appear that BOEM is applying the federal standards to these surveys equally across related industries.	Thank you for your comment. Renewable energy is bound by regulations in 30 CFR 585, which are different than the regulations for oil and gas. Regulations for renewable energy require SAPs to guide survey and site assessment activities. BOEM has issued guidelines for these activities: https://www.boem.gov/sites/default/files/renewable-energy-program/BOEM-Renewable-SAP-Guidelines.pdf. BOEM's Final EA for the NY Bight leases, *Commercial and Research Wind Lease and Grant Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf of the New York Bight*, was published in December 2021 and evaluated geotechnical studies that were used to support each lessee's SAP. Site assessment activities are necessary to determine the suitability of leases for commercial offshore wind, and that information is also used to support BOEM's COP-specific NEPA review. Additional geotechnical studies may be required for projects leading up to construction to obtain additional site-specific information to support final design and construction activities, which are analyzed in the PEIS and will be further analyzed in COP-specific NEPA documents.
BOEM-2024-0001-0383-0014	When high resolution seismic survey activities to identify shallow hazards archaeological resources or site evaluations and general shallow exploration purposes such as those being currently conducted by offshore wind developers in the New York Bight and which the PEIS proposes to further analyze and sanction are necessary for the oil and gas industry in the Gulf of Mexico for evaluating pipeline placement routes or site suitability for drilling rig placement BOEM requires that the developer submit an actual plan to BOEM for the activity. BOEM identifies these shallow hazard surveys for site evaluation/archeological resource identification/pipeline placement as "ancillary activities" that require plans for these activities to be submitted to BOEM per BOEM's NTL	Refer to response to comment BOEM-2024-0001-0383-0013.

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	No. 2009-G34:"Frequently Asked Questions for Ancillary Activities 1. Which type of ancillary activities will have their notifications converted into plans?...In addition to activities involving explosives and/or airguns the following types of activities also involve similar equipment that can produce noise at levels that can impact endangered threatened and/or protected species and will require their notifications to be converted into plans:.. High-resolution seismic surveys use acoustic sources to penetrate the sea floor from the sediment near-surface to several kilometers or more below the surface. These surveys are commonly used for identifying shallow hazards benthic biological communities archaeological resources site evaluation for drilling rig or pipeline emplacement sand resources and general shallow exploration purposes." [Footnote 36: See Microsoft Word - Ancillary-Activities-FAQ _TJB1_ _2_.rtf (boem.gov) and Microsoft Word - NTL2006-G12.doc (boem.gov). Emphasis in original.]	
BOEM-2024-0001-0383-0015	To reiterate these are shallow hazard seismic surveys designed for assessing site suitability for things like pipeline placement- similar to offshore wind export cable placement- and identifying archeological resources that could be impacted -the same as offshore wind developers are conducting- not the deep penetration seismic surveys used for exploration of oil reserves which are much stronger in power and deeper in scope. Yet even for the shallow hazard surveys in the Gulf of Mexico BOEM requires a plan as well as reports from the survey including information such as:"6. Vessel Information:a. Vessel types.b. Duration of the Activity (number of survey days).c. Survey location and configuration (including line kilometers).d. Number of vessels involved.e. Location of support bases transit routes and ports of call as well as vessel log information on number of port of call trips.f. Separation distance from other surveys.	Refer to response to comment BOEM-2024-0001-0383-0013.
BOEM-2024-0001-0383-0016	To our knowledge BOEM does not require the same information or plans to be submitted to BOEM regarding offshore wind shallow hazard surveys even those using the same equipment. Please explain. This is critical for several reasons. For example the requirements above to notify BOEM of all survey activity location data and separation distance from other surveys is important when assessing impacts to marine mammals. In the New York Bight lease	Refer to response to comment BOEM-2024-0001-0383-0013.

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	area and surrounding area high resolution seismic shallow hazard surveys are ongoing simultaneously by many developers with surveys overlapping in time and space. We have attached various developer notices to mariners as part of this comment to illustrate this point as well as a USCG District 1 Local Notice to Mariners which also shows all the New York Bight overlapping surveys in just one week's time. By not requiring the same survey plans and associated information that BOEM requires of offshore oil and gas developers in the Gulf of Mexico data on exactly where surveys were when distance from other survey vessels and other information that would be pertinent to the marine mammal investigations discussed below is unavailable. The same standards should be applied to all offshore energy development under BOEM's purview; there should not be differing standards for the same offshore energy activities. To illustrate this point we point to the Notice to Mariners issued by an offshore wind developer holding a lease in the New York Bight which states "The M/V SANCO SWIFT continues to collect bathymetric and ultra-high resolution seismic data within the lease area using a towed array of acoustic sources and receivers. Data collection will occur through mid-June 2024." [Footnote 38: See COSW-Fisheries-Notice_2024-02_final.pdf (communityoffshorewind.com) and attached.] Clearly the offshore wind survey is using ultra high-resolution seismic equipment to collect this data. This is the same equipment that if used in oil and gas shallow hazard surveys is required to comply with the BOEM requirements for submission of a plan detailed survey data etc. discussed above. This particular offshore wind developer's high resolution seismic survey is using the Geo-Source 200-400 marine multi-tip sparker system as a seismic source according to its 2023 NOAA Incidental Take Authorization application. [Footnote 39: See https://www.fisheries.noaa.gov/s3/2023-04/COSWHRG-2023IHA-App-OPR1.pdf p. 12.] The 2023 Federal Register Notice authorizing the developer's Incidental Harassment Authorization notes "The only acoustic sources planned for use during COSW's HRG survey activities with the potential to cause incidental take of marine mammals are the sparkers There are two sparker systems planned for use: Applied Acoustics Dura-Spark UHD 400+400 Seismic Sound	

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	Source (400 tip/3001000 joules (J)) and the Geo- Source 200400 Marine Multi-Tip Sparker System (400 tip/3001000 J) [Footnote 40: See https://www.federalregister.gov/documents/2023/06/30/2023-13990/takes-of-marine-mammals- incidental-to-specified-activities-taking-marine-mammals-incidental-to.]	
BOEM-2024-0001-0383-0017	However a simultaneous 2023 Federal Register notice authorizing an offshore oil and gas developer's Incidental Take Authorization in the Gulf of Mexico states that the sparkers used in this survey is the same brand and model as that used in the offshore wind survey: "Depending on the survey objective source vessels will tow. sparker system (e.g. Geo-Source 200400). During survey effort using non-airgun sources only the sparker source has the potential to cause incidental take of marine mammals." [Footnote 41: See https://www.federalregister.gov/documents/2023/08/24/2023-18220/taking-and-importing-marine- mammals-taking-marine-mammals-incidental-to-geophysical-surveys-related.] Another similarity between the two surveys is that both the oil and gas survey and the offshore wind survey are both authorized by NOAA only for Level B Harassments pursuant to the Marine Mammal Protection Act. [Footnote 42: For the oil and gas authorization documents see https://www.federalregister.gov/documents/2023/08/24/2023-18220/taking-and-importing-marine-mammals- taking-marine-mammals-incidental-to-geophysical-surveys-related and https://www.fisheries.noaa.gov/s3/2023- 08/ExxonMobil-GOMLOA-LOA-OPR1.pdf. For the offshore wind documents see https://www.fisheries.noaa.gov/s3/2023-06/COSW-2023IHA-FIHA-508-OPR1.pdf.] However there are major differences between both the numbers and types of mammals impacted. The Gulf of Mexico survey authorizes 6584 Level B Harassments of marine mammals; none of them are endangered species. The New York Bight offshore wind survey on the other hand is authorized for 14193 Level B Harassments of marine mammals including several endangered species. The offshore wind survey is authorized for 24 Level B Harassments of critically endangered North Atlantic Right Whales (which is "one of the world's most endangered large whale species" according to NOAA with only 360 individuals remaining) [Footnote 43: See https://www.fisheries.noaa.gov/species/north-atlantic-right-	Refer to response to comment BOEM-2024-0001-0383-0013.

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	whale.] 76 Level B Harassments of endangered fin whales and 24 Level B Harassments of endangered sei whales and 10 Level B Harassments of endangered sperm whales. [Footnote 44: See https://www.fisheries.noaa.gov/s3/2023-06/COSW-2023IHA-FIHA-508-OPR1.pdf. See https://www.fisheries.noaa.gov/species/sperm-whale]	
BOEM-2024-0001-0383-0018	Therefore both the Atlantic offshore wind shallow hazard seismic survey and the Gulf of Mexico offshore oil and gas shallow hazard seismic survey are deploying Geo-Source 200-400 sparkers as a seismic source. Both authorizations from NOAA note that the sparkers have the potential to cause incidental take of marine mammals. Both surveys are only authorized by NOAA for Level B Harassments of marine mammals pursuant to the Marine Mammal Protection Act. [Footnote 45: The offshore wind survey off NJ and NY plans to use Geo Source 200-400 sparkers an acoustic source. (https://www.fisheries.noaa.gov/s3/2023-04/COSWHRG-2023IHA-App-OPR1.pdf p. 12). Using this equipment as the acoustic source it is only authorized for MMPA Level B Harassments (https://www.fisheries.noaa.gov/s3/2023- 06/COSW-2023IHA-FIHA-508-OPR1.pdf p. 1). The corresponding oil and gas survey in the Gulf of Mexico also uses the Geo-Source 200-400 sparker system as an acoustic source capable of incidental takes of marine mammals (https://www.federalregister.gov/documents/2023/08/24/2023-18220/taking-and-importing-marine-mammals- taking-marine-mammals-incidental-to-geophysical-surveys-related). That survey is also only authorized for MMPA Level B Harassments. (https://www.fisheries.noaa.gov/s3/2023-08/ExxonMobil-GOMLOA-LOA-OPR1.pdf).] This is the same equipment doing the same job with the same potential impacts to marine mammals authorized for the same MMPA Level B Harassment incidental takes. Yet the offshore wind survey is not required to comply with the same BOEM regulations as the offshore oil and gas survey. BOEM's requirements for a plan and associated information for high resolution seismic surveys by the oil and gas industry in the Gulf of Mexico are due to the surveys' potential to "impact endangered threatened and/or protected species and will require their notifications to be converted into plans." [Footnote 46: See Microsoft Word - Ancillary-Activities-	Refer to response to comment BOEM-2024-0001-0383-0013.

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	FAQ _TJB1_ _2_.rtf (boem.gov). In conjunction with Microsoft Word - NTL2006-G12.doc (boem.gov).] Yet the offshore wind surveys are expected to impact endangered species while the oil and gas surveys are not. If the same equipment is being used for the same purposes with the same MMPA Level B Harassments via Incidental Take Authorizations requested of NOAA is being used by the offshore wind industry in the Atlantic why doesn't BOEM require the same plan and associated information for the same reasons in the Atlantic?	
BOEM-2024-0001-0383-0019	And in the Atlantic even more so as the number of marine mammal species impacted is greater than in the Gulf of Mexico and those species in the Atlantic include both endangered and critically endangered species while the Gulf of Mexico surveys do not. The impacts are especially important considering the number of large baleen whale species that migrate though and live year-round in many of the offshore wind leases and cable corridor areas where these high-resolution seismic surveys are ongoing. This includes the critically endangered North Atlantic Right Whale [Footnote 47: See https://www.fisheries.noaa.gov/species/north-atlantic-right-whale.] the endangered fin whale [Footnote 48: See https://www.fisheries.noaa.gov/species/fin-whale.] the endangered sei whale [Footnote 49: See https://www.fisheries.noaa.gov/species/sei-whale.] the Atlantic humpback whale which began experiencing an unusual mortality event when offshore wind surveys began off the Atlantic coast in 2016-2024 [Footnote 50: See 20162024 Humpback Whale Unusual Mortality Event Along the Atlantic Coast | NOAA Fisheries and Incidental Take Authorizations for Other Energy Activities (Renewable/LNG) | NOAA Fisheries. Smaller surveys/projects of Cape Wind and Block Island Wind Farm began in 2014-2015 but DONG Energy began its larger scale geophysical and geotechnical surveys offshore Massachusetts beginning in 2016; with other developers Ocean Wind and Deepwater Wind following suit beginning in 2017; with developers Statoil and Garden State Offshore Energy and Deepwater Wind New England and Bay State Wind and Dominion Energy Virginia following suit beginning in 2018; with developers Equinor and Avangrid Renewables and Orsted and	Refer to response to comment BOEM-2024-0001-0383-0013.

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	Skipjack Offshore Energy following suit in 2019; with developers Vineyard Wind and Atlantic Shores Offshore Wind and Dominion Energy Virginia and Mayflower Wind Energy and Equinor Wind and Orsted Wind Power North America following suit in 2020; with Dominion Energy Virginia and Kitty Hawk Wind and Skipjack Offshore Energy and Atlantic Shores Offshore Wind and Ocean Wind and Garden State Offshore Energy and Vineyard Wind Mayflower Wind Energy and Vineyard Wind 1 following suit in 2021; with Orsted Wind Power North America and Atlantic Shores Offshore Wind and Ocean Wind II and Orsted Wind Power North America and Ocean Wind and Dominion Energy and NextEra Energy Transmission Mid Atlantic Holdings and Vineyard Wind 1 and Kitty Hawk Wind and Atlantic Shores Offshore Wind Bight and Park City Wind and Attentive Energy and Orsted Wind Power North America and South Fork Wind following suit in 2022; with Bluepoint Wind and Vineyard Wind and Orsted Wind Power North America and SouthCoast Wind Energy and TerraSond Limited and Atlantic Shores Offshore Wind and Attentive Energy and Community Offshore Wind and Invenergy Wind Offshore and Ocean Wind II and Vineyard Northeast and Atlantic Shores Offshore Wind Bight and Ocean Wind and Orsted North America and Revolution Wind and Park City Wind and Dominion Energy Virginia and Empire Offshore Wind following suit in 2023-24.] and the minke whale which has experienced an unusual mortality event from 2017-2014 during this same timeframe of offshore wind surveys. [Footnote 51: See 20172024 Minke Whale Unusual Mortality Event along the Atlantic Coast | NOAA Fisheries.]	
BOEM-2024-0001-0383-0020	Furthermore the NOAA Incidental Take Authorizations for offshore wind shallow hazard surveys compared to offshore oil and gas shallow hazard surveys also contain different requirements. In addition to the BOEM plan requirements described above NOAA authorizations for the Gulf of Mexico survey require survey shutdowns in the event of a live stranding or near shore atypical milling of marine mammals within 50 km of the survey operations and potential investigations if "NMFS determines that the circumstances of any marine mammal stranding found in the vicinity of the activity suggest investigation of the association with survey activities is warranted". [Footnote 52: See	Refer to response to comment BOEM-2024-0001-0383-0013.

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	https://www.fisheries.noaa.gov/s3/2023-08/ExxonMobil-GOMLOA-LOA-OPR1.pdf p. 12 of 14.] No such provisions are required for the aforementioned offshore wind survey activity despite the fact that the equipment and MMPA Harassment levels requested are the same. [Footnote 53: See Incidental Take Authorization: Community Offshore Wind LLC Marine Site Characterization Surveys off New Jersey and New York | NOAA Fisheries and Federal Register :: Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Site Characterization Surveys in the New York Bight.]NOAA's own documents state that offshore wind surveys are expected to cause temporary deafness of marine mammals which can lead to "serious" effects that repeated exposure to temporary deafness can lead to permanent deafness but that there is no data on noise induced hearing loss for baleen whales-exactly the species that are both endangered and experiencing unusual mortality events on the Atlantic Coast in the very areas being surveyed for offshore wind development. [Footnote 54: See Federal Register notice for Atlantic Shores Incidental Take Authorization at https://www.federalregister.gov/documents/2020/04/16/2020-07969/takes-of-marine-mammals-incidental-to- specified-activities-taking-marine-mammals-incidental-to and Federal Register notice for the Sunrise Wind Incidental Take Authorization at https://www.federalregister.gov/documents/2023/02/10/2023-02497/takes-of- marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to-the.] Therefore we request that BOEM ask NOAA a cooperating agency regarding offshore wind actions to explain the discrepancy between these two approaches to offshore energy development with attention to the exact same equipment being used for each.	
BOEM-2024-0001-0383-0021	We also request that BOEM explain its rationale for having one approach for shallow hazard surveys in the Gulf of Mexico and another for shallow hazard surveys in the NY Bight Atlantic region of this PEIS. Considering the scores of large baleen whale deaths on the US East Coast over the past 18 months which led to calls by 30 coastal NJ mayors as well as three US Congressmen for a pause on further offshore wind surveying until an investigation of any link	Refer to response to comment BOEM-2024-0001-0383-0013.

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	between the surveys and whale deaths could be completed [Footnote 55: See CONGRESSMEN HARRIS AND VAN DREW RENEW CALLS FOR WINDMILL MORATORIUM AMIDST WHALE DEATHS | Congressman Andy Harris (house.gov) Smith renews call to pause offshore wind projects after ninth dead whale in two months washes ashore in Manasquan | U.S. Representative (house.gov) and see attached press release.] it is unclear how BOEM and NOAA can require via regulation both a pause and an investigation of mammal strandings as well as detailed survey plans for assessment of impacts in this situation when coinciding with shallow hazard surveys in the Gulf of Mexico but not for shallow hazard surveys in the Atlantic which are using the same equipment. Please explain.	
BOEM-2024-0001-0423-0031	Representative Project Design Envelope The seabed footprint in the representative PDE is unrealistically small. The RPDE WTG seabed footprint with scour protection is 0.24 acres per monopole foundations. Ocean Winds suggests BOEM use 0.95 acres per monopole foundation. This footprint would be in line with the footprints in Empire Wind's and Coastal Virginia Offshore Wind's PDE (0.91 acres and 0.95 acres respectively). The RPDE footprint for offshore substations is 8.05 acres. Ocean Winds suggests up to 9 acres which would be less than that proposed in SouthCoast Wind's COP. Lastly the RPDE export cable size is 16 inches in diameter. Ocean Winds suggests a cable diameter of 19 inches be used. The Draft PEIS provides examples of points of interconnection (POIs) in New York and New Jersey (Volume 1 page 2-6) but does not include the possibility of a POI at the Deans substation in New Jersey which is likely to be a requirement of New Jersey's 2024 solicitation. While every possible POI cannot and should not be included in the PEIS this is one that could be used by multiple lessees and is appropriate to add.	As described in Section 2.1.2.1, the RPDE in the PEIS was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey, and it was prepared before lessees submitted COPs for BOEM review. The RPDE includes a range of representative parameters of offshore wind development in the NY Bight. The RPDE is not meant to be prescriptive and includes a range of parameters that is representative of development that could occur associated with any of the six NY Bight lease areas. Based on this, BOEM believes the RPDE is appropriate and sufficiently broad for purposes of the PEIS. Regarding the POIs, PEIS Section 2.1.2.1.1 identifies examples of potential POIs in both New York and New Jersey. Because there are several possible locations for POIs and because the exact cable routing and other onshore infrastructure are not known, the analysis of the offshore export cables and onshore infrastructure in the PEIS is regional in nature; site-specific analysis is deferred to the COP-specific NEPA analysis.
BOEM-2024-0001-0425-0004	The currently proposed de-commissioning plan is deficient in its lack of lasting safeguards monitoring procedures bonding requirements or the required posting of monies/guarantees or relevant safeguards to provide environmental protections in perpetuity as to such massive industrial construction proposed to be placed in a prime hurricane/northeast storm zone.	Refer to responses to comments BOEM-2024-0001-0354-0011 and BOEM-2024-0001-0354-0013.

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	Based upon my understanding of conversations I had with BOEM officials at the Toms River New Jersey February 8 2024 informational meeting I learned that BOEM usually does not devote any comprehensive focus upon de-commissioning issues during the draft Environmental Impact Statement stage of review. I also learned BOEM has experience in reviewing procedures and the implementation of safeguards and monitoring techniques as to de-commissioning issues associated with [underlined: land based] (emphasis added) wind turbine projects. With respect to [underlined: ocean based] (emphasis added) proposals BOEM is essentially learning as it goes along as to such ocean projects with what might be labeled to be good faith trial and error process. BOEM officials might be quick to criticize any such characterization as being over simplistic. Nevertheless it is clear that there is no base line of studies in existence or of a comprehensive record of a decision making process with appropriate monitoring techniques and safeguards concerning any significant ocean wind turbine project. The basis of such an uncontroverted fact concerns the lack of history of any such projects being in existence as to the ocean for any significant time frame for study. Additionally European models of wind turbines not located in a prime North Atlantic hurricane and northeast storm zones do not provide a transferrable applicable body of knowledge and history. Further the actual shelf life of wind turbines with their non-biodegradable blades supports a conclusion that de-commissioning would be necessary as early as 10 to 20 years after construction even assuming that a particular wind turbine was not rendered irretrievable or destroyed by storm events. Simply put it is imperative to create an enforceable realistic determination of safeguards and monitoring techniques at the onset of the wind turbine project approval process. Related to the above arguments I would hereby respectfully note that once a bureaucracy and its officials and employees have all become invested into a process and concept such a commitment becomes a self-fulfilling prophecy. As such it would be exceedingly difficult if not virtually impossible to support or to stop any approval process of such massive wind turbine projects if de-commissioning issues are left to be addressed	

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	in the end stages of the approval process or even at a midway point. Related critical concerns as to de-commissioning if indeed the process is even possible must be addressed now. Simple approvals before local planning boards invariably require an applicant/developer to post a bond as a safeguard to make sure a project is completed in a safe and final manner as per approvals. Such a concept should be applied to the industrialization of the ocean through wind turbine construction as contemplated. This assumes for the sake of argument BOEM proceeds down a path which many commentators have described as being purposely too fast and far too much as to the numbers of approvals sought. Consideration should also be given that potentially all of the wind turbine project applicants to date have been partially or totally owned by foreign corporate entities. Risks associated with bankruptcy abandonment of the project during construction or preconstruction stage and related financial issues have already occurred with respect to wind turbine projects already approved. At the very least if BOEM considers moving forward with the current NY Bight project requirement for a nonrefundable posting of funds or nonredeemable insurance coverage must be enacted even at the draft EIS stage of the process. It is fundamentally unfair for citizens environmental groups fishing interests or interested concerned citizens to have to consider filing their own enforcement actions related to de-commissioning. It is highly doubtful that foreign jurisdictions or even the International Court at the Hague would entertain any such filings or claims for relief in a timely and realistic manner. A final related issue concerns unaddressed needs for a realistic cost benefit analysis and a computation of ascertainable losses or damages all of which must be included as a safeguard in the de-commissioning process. Clearly similar insurance requirements or other monitoring techniques applied to United States Courts jurisdictions for land based wind turbine projects in all likelihood serve as a very limited if not useless model to be applied to the de-commissioning international process at hand. The record is entirely deficient to date as realistic enforceable adequate (if indeed achieving "adequacy" with an appropriate level of damages is even possible) safeguards have not been addressed.	

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BOEM-2024-0001-0438-0001	PSEG supports the goals of the PEIS to increase efficiencies in future offshore wind generation project-specific NEPA analysis and support timely decisions on project-specific construction and operation plans (COPs). PSEG appreciates the comprehensive nature of the New York Bight Draft PEIS and the robust involvement from cooperating agencies stakeholders and the public in its development. As discussed in these comments however the PEIS as currently drafted does not appear to fully consider the States of New Jersey and New York's public policies and offshore wind goals. These include for example the ongoing State Agreement Approach process (SAA 2.0) led by PJM Interconnection LLC (PJM) and the New Jersey Board of Public Utilities (BPU) and the ongoing Public Policy Transmission Need (New York City PPTN) process led by the New York Public Service Commission (NYPSC) and the New York Independent System Operator (NYISO) each of which contemplate transmission alternatives including shared corridors and offshore Points of Interconnection (POIs) and the potential for different ownership of transmission and generation facilities. [Footnote 2: The New England states and ISO have also contemplated offshore transmission solution that contemplates networked or "meshed" multi-terminal high voltage direct current (MTDC) system as that technology becomes available. A solicitation for that type of solution will likely be issued within the next two years. See New England Energy Vision New England States Transmission Initiative https://newenglandenergyvision.com/new-england-states-transmission-initiative/; Letter from NYISO PJM and ISO NE to Dep't of Energy (June 27 2023) https://www.iso-ne.com/static-assets/documents/2023/06/northeast_collaborative_doe_june_letters_combined.pdf.] As outlined in our comments below PSEG therefore strongly encourages BOEM to closely coordinate with the states as they finalize these transmission solicitations and as BOEM develops the final PEIS and any programmatic avoidance minimization mitigation and monitoring (AMMM) measures that BOEM may require as conditions of approval for activities proposed by lessees in COPs submitted for the New York Bight. Aligning the analyses undertaken in the PEIS with State transmission solicitations and planning for regional transmissional solutions by BOEM and the	Section 2.1.2.1.1 of the Final PEIS states that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (New York City Public Policy Transmission Need [NYC PPTN]) and nearshore (New Jersey Board of Public Utilities Prebuild Infrastructure) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey. Appendix D, *Planned Activities Scenario*, has also been updated to describe the States of New Jersey and New York's public policies and offshore wind goals.

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	Department of Energy in their Offshore Wind Transmission Action Plan for the U.S. Atlantic Region [Footnote 2: See BOEM Dep't of Energy Offshore Wind Transmission Development in the U.S. Atlantic Region https://www.energy.gov/sites/default/files/2023-10/Atlantic-Offshore-Wind-Transmission-Plan-Report_October-2023.pdf. This Action Plan was informed by the forthcoming Atlantic Offshore Wind Transmission Study from the National Renewable Energy Laboratory (NREL). See NREL Atlantic Offshore Wind Transmission Study https://www.nrel.gov/wind/atlantic-offshore-wind-transmission-study.html] will ensure that federal and state decision-makers are undertaking a consistent approach to build out necessary transmission to support Atlantic Coast offshore wind development. This in turn will deliver certainty for the industry and advance both the Biden Administration's and the States' offshore wind generation goals.	
BOEM-2024-0001-0438-0007	Specific Comments PSEG's specific comments below highlight the need for federal-state collaboration and coordination in development of the final PEIS and any AMMMs. Aligning the analyses undertaken in the PEIS with state transmission solicitations and state transmission planning ensures a consistent approach to transmission buildout. This in turn supports offshore wind development in the New York Bight and delivers certainty for both offshore wind generation and transmission developers which improves economic outcomes for supporting industries and ratepayers.	Comment noted. Please see responses to individual comments for submission BOEM-2024-0001-0438 below.
BOEM-2024-0001-0438-0008	1. The PEIS should be consistent with the New Jersey and New York OREC and transmission solicitations. As described in detail above in addition to their solicitations for offshore wind generation[Footnote 7: New York has issued awards for three OREC solicitations in support of its goal to reach 9000 GW of offshore wind by 2035. See https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations. It expects to issue an award for the fourth OREC solicitation in February 2024. New Jersey has issued three awards for OREC solicitations and anticipates announcing a fourth OREC solicitation in the spring of 2024 in support of its goal of 11000 MW by 2040. An award for that solicitation is expected in Q1 2025.] both New Jersey	Section 2.1.2.1.1 of the Final PEIS states that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (NYC PPTN) and nearshore (NJBPU PBI) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey. Appendix D, *Planned Activities Scenario*, has also been updated to describe the States of New Jersey and New York's public policies and offshore wind goals.

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	and New York are in the process of developing transmission solicitations to deliver power necessary to meet each of their ambitious offshore wind goals. Those transmission solicitations which assume delivery of offshore wind power from the New York Bight and potentially other lease areas will address transmission configurations locations for POIs and routing and set forth certain requirements including environmental compliance and mitigation measures. Although the draft PEIS references the "New Jersey State Agreement approach" and "future procurements" in the AMMMs it does not specifically point to the NY PPTN and SAA 2.0 both of which will be released in 2024 and play a key role in delivering power from the New York Bight projects analyzed in the PEIS once the awards for those solicitations are made in 2025. As BOEM will be finalizing the PEIS concurrently with the states' development and issuance of the solicitations PSEG strongly encourages BOEM to collaborate closely both with New Jersey and New York. Any analysis in the PEIS related to transmission configurations and routing options and any proposed AMMMs that impact transmission facilities including export cables OSSs and other platforms should be consistent with the directives in those solicitations.	
BOEM-2024-0001-0438-0011	Similarly PSEG recommends that BOEM expand its discussion of the multiple transmission configuration options that the New York Bight lessees may use. BOEM explains that these options could include radial configurations (generation lead and shared line (platform) topology and networked configurations (backbone and meshed grid topologies) and notes that they will require "different levels of coordination between transmission and wind project operators." [Footnote 8: See Draft PEIS Volume I page 2-13] The draft PEIS and proposed AMMMs do not make clear however that these options could include transmission infrastructure (e.g. OSSs and export cables) for which a transmission developer rather than a lessee might be responsible (e.g. pursuant a state solicitation). PSEG therefore encourages BOEM to more clearly describe these options including ownership operation and potential location of the transmission facilities and to align those descriptions with the New York and New Jersey solicitations.	Chapter 2 of the PEIS provides a discussion of transmission configuration options and notes that transmission infrastructure may be developed, owned, and operated by either a transmission developer or a lessee.

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BOEM-2024-0001-0438-0009	2. The PEIS should recognize that development of shared transmission infrastructure or corridors should be guided by the states in collaboration with BOEM; this burden should not be shifted to the lessee. Although BOEM acknowledges that "state power solicitations may dictate routing measures for export cables and associated substations" to maximize the utility of POIs" [Footnote 9: See Draft PEIS Volume I page 2-20] it nonetheless appears to be directing lessees toward co-locating transmission infrastructure and shared infrastructure. For example AMMM measure MUL-18 which applies to multiple resource areas states that: "Lessees should coordinate transmission infrastructure among projects. Where practicable transmission infrastructure should use shared intra- and interregional connections have requirements for meshed infrastructure apply parallel routing with existing and proposed linear infrastructure (including export cables and other existing infrastructure such as power and telecommunication cables pipelines) and limit the combined footprint to minimize impacts and maximize potential capacity." [Footnote 10: See Draft PEIS Volume II pages G-20 G-21. BOEM considers the adoption of MUL-18 and the impacts of shared transmission infrastructure at multiple points in the PEIS. See e.g. 3.6.6-32 (considering impacts on navigation and vessel traffic) and 3.5.2-37 (considering impacts on benthic resources).] While MUL-18 does recommend that "[l]essees considering landfall in New Jersey should also comply with the results of the state agreement approach (SAA) and any other future procurements resulting from similar initiatives" it does not reference the NY PPTN which calls out the need for shared corridors. Footnote 11: See Draft PEIS Volume II page G-20 G-21] Moreover the analysis in the draft PEIS and AMMM MUL-18 clearly would place the burden on the New York Bight lessees to coordinate the routing of their transmission infrastructure. [Footnote 12: See id.] Doing so is overly burdensome and infeasible. There are technological and regulatory challenges that cannot be resolved by the lessee alone. Rather than placing the burden on the lessee coordination of transmission infrastructure should be guided by the soliciting state agencies in collaboration with BOEM. PSEG again encourages BOEM to work	Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impact. These RPs are also not part of the Proposed Action. MUL-18 is an RP. Section 2.1.2.1.1 of the Final PEIS states that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (NYC PPTN) and nearshore (NJBPU PBI) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey. Appendix D, *Planned Activities Scenario*, has also been updated to describe the States of New Jersey and New York's public policies and offshore wind goals. Additional analyses will be conducted at the subsequent project-specific stage for each lease area. Although BOEM's authority under the OCSLA only extends to the activities on the OCS, alternatives related to addressing nearshore and onshore elements as well as offshore elements of the Proposed Action would be analyzed in the COP-specific NEPA stage. BOEM's regulations (30 CFR 585.620) require that the COP describes all planned facilities that the lessee would construct and use for a project, including onshore and support facilities and all anticipated project easements. As a result, those federal, state, and local agencies with jurisdiction over nearshore and onshore impacts are able to implement, at their discretion, those portions of BOEM's COP-specific NEPA document that support their own permitting decisions.

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	closely with New Jersey and New York to ensure that its analysis defers to the existing and upcoming state solicitations.	
BOEM-2024-0001-0438-0010	3. In assessing transmission interconnection options within the PEIS BOEM should consider state solicitations that require offshore POIs. Within the draft PEIS BOEM only considers locating POIs onshore and lists several examples of potential onshore POIs. [Footnote 13: See Draft PEIS Volume I at pg. 2-6.] This is at odds with state solicitations in New Jersey and New York that contemplate issuing transmission solution awards for projects with offshore POIs. In the draft PEIS BOEM inconsistently recognized state solicitations; in one instance BOEM noted that New Jersey required that bidders for the third OREC solicitation use the onshore Larrabee Tri-Collector Solution transmission solution as the POI [Footnote 14: See id. at n.1.]but BOEM failed to consider that the NY PPTN requires solutions that will interconnect at offshore POIs and that SAA 2.0 in New Jersey also considers offshore POIs. In assessing transmission interconnection options BOEM should consider all state solicitations including those that require offshore POIs. This is particularly important as the separation of transmission and generation by locating the POI offshore is essential to enable coordination of transmission infrastructure. ISOs and RTOs should be coordinating with the states to issue solicitations seeking coordinated transmission solutions. BOEM should therefore consider state solicitations that require offshore POIs in assessing transmission interconnection options.	Section 2.1.2.1.1 of the Final PEIS states that in New York and New Jersey, efforts are underway to develop transmission infrastructure that would allow multiple offshore wind projects to interconnect at an offshore (NYC PPTN) and nearshore (NJBPU PBI) POI. Appendix B, *Supplemental Information and Additional Figures and Tables*, provides additional detail regarding the transmission infrastructure development efforts in New York and New Jersey.
BOEM-2024-0001-0439-0023	The PEIS is overly conservative resulting in unrealistic assessments. While the OSW industry strongly supports BOEM's use of a representative project design envelope the PEIS assesses construction timelines that are unrealistic and overly conservative. For example the PEIS unrealistically assumes that all 6 NY Bight projects will be built the same year and in the same year as other NY/NJ offshore wind projects. According to Table D-2 (Appendix D of the PEIS) the analysis assumes that all 1125 NY Bight foundations will be constructed in 2026 with a total of 1601 foundations in 2026 when combined with other NY/NJ projects. This approach exacerbates and overestimates air quality impacts and almost all other impacts in the "6 NY Bight Project" and "Cumulative Project"	Because the PEIS was developed before COPs were issued and the specific schedule for NY Bight project development is not known, the PEIS uses conservative assumptions for analysis. Table D-2 in Appendix D shows that construction of the NY Bight projects could start in 2026 and extend to 2030 and beyond. Consistent with other projects in the table, BOEM displays all foundations being installed in the first year of construction in the absence of information from developers on timing of foundation installation. This provides a more conservative assumption for analysis and means that impacts would likely be less because foundation construction would be spread out over a longer period of time. The analysis in Chapter 3 considers the potential

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	assessments. Such an analysis also overstates the benefits of mitigation measures as the benefits are greater when applied to many projects being constructed at once. BOEM should develop a reasonable buildout of the NY Bight leases based on timing for power delivery to meet state procurements and discussion with industry.	for all six NY Bight projects to be constructed simultaneously and staggered. For example, Section 3.5.7.4.2, *Sea Turtles*, explains that if all six NY Bight projects are constructed simultaneously, the ensonified region where noise impacts on sea turtles could occur would be much greater than if project construction was staggered.
BOEM-2024-0001-0439-0024	VII. It is unclear how the Draft PEIS calculates energy production when describing benefits of the projects. The PEIS notes that "[b]ased on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy."[Footnote 48: Draft PEIS at ES.] It is unclear what energy production value BOEM relies on to analyze the reductions in greenhouse gas emissions and to calculate impacts of reduced air emissions from the projects and the resulting human health benefits using USEPA's Co-Benefits Riks Assessment (COBRA).[Footnote 49: Draft PEIS 3.4.1-10.] It appears that BOEM uses the 280 WTG single project scenario however no GW value is provided. The OSW industry recommends that BOEM provide the GW value used for this analysis as well as details on how that GW number was calculated (e.g. number of WTGs multiplied by MW capacity of a WTG). In contrast to the benefits it is very clear how adverse impacts from the project are measured as BOEM utilizes a scenario of up to 280 WTGs for a single project and up to 1103 WTGs for all six projects. For calculating air emissions related to construction of the projects BOEM estimates a total of 1680 WTGs across all six projects. Conservatively assuming that each project uses 15 MW WTGs this would result in over 16.5 GW (if 1103 WTGs is used) or approximately 25 GW of energy production (if 1680 WTGs) is used for the six lease areas. The result of this is an extreme discrepancy between the 5.6 to 7 GW assumption for energy production from the NY Bight leases and the scenario used for maximum-case adverse impacts from offshore wind development in the NY Bight. If BOEM is assuming adverse impacts from such a build out BOEM must also calculate the benefits of generating that much clean energy. If BOEM is using the 280 WTG single project scenario and the 1130 WTG six project scenario to calculate avoided	The estimated power ratio of 3 MW per square kilometer and an estimate of 5.6 to 7 GW for total generating capacity of the NY Bight leases presented in Section 1.3 of the PEIS are derived from the BOEM December 2021 Final Sale Notice for the NY Bight leases. BOEM has added a footnote to this statement in Section 1.3 clarifying the source of this information. The power-generating capacity from the Final Sale Notice is provided for informational purposes and is not used in the analysis of the alternatives; the analysis of the alternatives is based on the parameters of the RPDE described in Section 2.1.2 of Chapter 2. BOEM recognizes that as technology advances and as projects are designed to maximize power output, the actual generation capacity of the NY Bight lease areas could be greater. Refined estimates of the anticipated generation capacity of each project proposed in the NY Bight lease areas will be described in each COP and its project-level NEPA analysis. In regard to the analysis of adverse and beneficial air quality impacts in Section 3.4.1, *Air Quality and Greenhouse Gas Emissions*, BOEM based its analysis for a single representative project on development of 280 WTGs consistent with the RPDE, as defined in Section 2.1.2.1. For purposes of estimating avoided emissions, BOEM assumed a generation rating per WTG of 12 MW, which BOEM anticipates is a conservative estimate of the generation capacity of turbines that could be used for the NY Bight projects; if the turbines selected for each NY Bight project have a larger generation capacity, the avoided emissions would be greater. For the analysis of six projects, BOEM assumed the construction and O&M emissions and avoided emissions from one NY Bight project would be multiplied by as much as six. As noted in a footnote in Section 3.4.1.4.2, the number of WTGs in the six NY Bight lease areas is expected to be less than 1,680 (280

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	emissions the statement that the NY Bight leases producing 5.6 to 7 GW of offshore wind energy should be revised to reflect the actual energy production being used to calculate impacts in the analysis. Not doing so creates a discrepancy in the PEIS and could lead to confusion among stakeholders and an inaccurate characterization of adverse and beneficial impacts. For purposes of evaluating the projects' projected reduction in emissions we recommend that BOEM make it clear that the NY Bight offshore wind projects are expected to result in the delivery of at least 16.5 GW of clean renewable energy to the grid.	WTGs multiplied by 6 projects). However, in the interests of capturing the highest amount of potential emissions, this section describes emission estimates as being as much as six times greater than a single NY Bight project. Therefore, this analysis likely overstates total emissions and impacts for six NY Bight projects.
BOEM-2024-0001-0440-0004	IV. Other Areas of Concern In addition to the conceptual concerns raised above Shell has identified a number of other specific issues in the draft PEIS for BOEM's consideration. a. Representative Project Design Envelope With respect to the "representative project design envelope" (RPDE) used for the analysis, Shell is concerned that some of the assumptions may not be realistic. First the RPDE assumes turbine rotor diameters up to 370 meters which appears to be high relative to the rotor diameters expected to be available during the buildout of the Bight lease areas. Shell recommends that BOEM use a 220m-300m range which would account for turbines up to approximately 22MW. Second the RPDE considers up to five offshore substations (OSSs) for each project. However most Bight projects are expected to use high-voltage direct current (HVDC) transmission with each OSS having at least l GW capacity meaning no more than two to three OSSs per lease area is expected. The overestimation of the number OSSs may skew the assessment of impacts. With the reduction in OSSs a similar reduction in number of export cables could be considered. Finally the RPDE's assumed seabed footprint for monopiles is 0.24 acre (ac) for a WTG and 0.51 ac for an OSS. However the area of the scour protection could be larger depending on the current and seabed characteristics. Shell recommends that BOEM revisit this assumption to minimize as much as possible the need for additional analysis of seabed footprint in the project-specific environmental reviews.	As described in Section 2.1.2.1, the RPDE in the PEIS was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. The RPDE is not meant to be prescriptive and includes a range of parameters that is representative of development that could occur associated with any of the six NY Bight lease areas. Based on this, BOEM believes the RPDE is appropriate and sufficiently broad for purposes of the PEIS.

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BOEM-2024-0001-0440-0006	c. Conceptual Decommissioning Shell recommends that the final PEIS include a section that details the type and scope of activities BOEM envisions occurring during "conceptual decommissioning." While certain aspects and potential impacts of "conceptual decommissioning" are discussed throughout the draft PEIS the final PEIS should include a single overview discussion of decommissioning that would help to ensure that the analysis of decommissioning is robust across all impacted resources.	Section 2.1.2.1.3, *Conceptual Decommissioning*, describes the basic element of conceptual decommissioning that BOEM would expect to occur for the six lease areas. Each Chapter 3 section analyzes the potential impacts from conceptual decommissioning. Additional details on decommissioning will be described and analyzed in each COP-specific NEPA document based on the decommissioning activities proposed by each lessee in its COP.
BOEM-2024-0001-0447-0009	Geo Physical Survey The PEIS discusses under its description of one representative project that prior to installation pre-construction surveys such as geophysical and geotechnical or high-resolution geophysical surveys may be needed to refine the design. However these types of surveys are already ongoing approved by the EA for the NY Bight leases. BOEM issued a Finding of No Significant Impact for this EA and the related approved survey activities. But it does not appear that BOEM is applying the federal standards to these surveys equally across related industries. When high resolution seismic survey activities to identify shallow hazards archaeological resources or site evaluations and general shallow exploration purposes such as those being currently conducted by offshore wind developers in the New York Bight and which the PEIS proposes to further analyze and sanction are necessary for the oil and gas industry in the Gulf of Mexico for evaluating pipeline placement routes or site suitability for drilling rig placement BOEM requires that the developer submit an actual plan to BOEM for the activity. To our knowledge BOEM does not require the same information or plans to be submitted to BOEM regarding offshore wind shallow hazard surveys even those using the same equipment. We point to the Notice to Mariners issued by offshore-wind-developers holding a lease in the NY Bight which states The M/V SANCO SWIFT continues to collect bathymetric and ultra-high resolution seismic data within the lease area using a towed array of acoustic sources and receivers. Data collection will occur through mid-June 2024. Clearly the offshore wind survey is using ultra high-resolution seismic equipment to collect this data. This is the same equipment that if used in oil and gas shallow hazard surveys is	Renewable energy is bound by regulations in 30 CFR 585, which are different than the regulations for oil and gas. Regulations for renewable energy require SAP to guide survey and site assessment activities. BOEM has issued guidelines for these activities: https://www.boem.gov/sites/default/files/renewable-energy-program/BOEM-Renewable-SAP-Guidelines.pdf. BOEM's Final EA for the NY Bight leases, *Commercial and Research Wind Lease and Grant Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf of the New York Bight*, was published in December 2021 and evaluated geotechnical studies that were used to support each lessee's SAP. Site assessment activities are necessary to determine the suitability of leases for commercial offshore wind, and that information is also used to support BOEM's COP-specific NEPA review. Additional geotechnical studies may be required for projects leading up to construction to obtain additional site specific information to support final design and construction activities, which are analyzed in the PEIS and will be further analyzed in COP-specific NEPA documents.

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	required to comply with the BOEM requirements for submission of a plan detailed survey data etc. discussed above.	
BOEM-2024-0001-0447-0010	We also request that BOEM explain its rationale for having one approach for shallow hazard surveys in the Gulf of Mexico and another for shallow hazard surveys in the NY Bight Atlantic region of this PEIS. Considering the scores of large baleen whale deaths on the US East Coast over the past 18 months which led to calls by 30 coastal NJ mayors as well as three US Congressmen for a pause on further offshore wind surveying until an investigation of any link between the surveys and whale deaths could be completed it is unclear how BOEM and NOAA can require via regulation both a pause and an investigation of mammal strandings as well as detailed survey plans for assessment of impacts in this situation when coinciding with shallow hazard surveys in the Gulf of Mexico but not for shallow hazard surveys in the Atlantic which are using the same equipment.	Refer to response to comment BOEM-2024-0001-0447-0009.
BOEM-2024-0001-0450-0012	E. Quiet Foundations The Representative Project Design Envelope (RPDE) was created by compiling a range of technical parameters that describe the various conditions of the New York Bight leases in order to create a representative project for analysis. These conditions include a typical range for number of wind turbine generators turbine rotor diameter turbine height and foundation type among other design elements. We strongly advocate for the prioritization of quiet foundation technologies to mitigate the significant noise impacts associated with pile driving. With respect to foundation types within the RPDE we support the inclusion of measure MUL-6 in which BOEM encourages use of non-pile driving foundations [Footnote 32: Draft PEIS at G-19.] and ask that BOEM collaborate with developers in the NY Bight to support the efficient integration of quiet technologies in their projects. We also encourage BOEM to actively promote the adoption of quiet foundation technologies in the United States more broadly including through providing comprehensive guidance acknowledging their potential to provide developers with greater flexibility such as extended construction schedules and the possibility of night-time installations. [Footnote 33: Given detectability concerns and noise impacts from pile driving our groups do not support pile driving at	BOEM acknowledges the commenter's support for "quiet foundations." BOEM has added additional analysis to the Final PEIS regarding the differences in impacts between the foundation types in the RPDE, including within Section 3.5.2, *Benthic Resources*; Section 3.5.5, *Finfish, Invertebrates, and EFH*; Section 3.5.6, *Marine Mammals*; and 3.5.7, *Sea Turtles*.

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	night. The use of quiet foundation technologies however may allow for construction at night as the use of pile driving would be eliminated.] This shift would be game-changing in reducing the acoustic footprint of construction activities. In the Draft PEIS BOEM writes that "Monopiles or piled jackets are most likely" to be used while additional options include quiet foundations like "suction mono-bucket suction bucket jacket tri- suction pile caisson and gravity-based structures." [Footnote 34: Draft PEIS at 2-3] As we have urged BOEM in prior comments there remains a need for a more detailed analysis to justify the preference for piled foundations over the consideration of quiet foundation technologies in project planning. The analysis presented in the Draft PEIS also appears imbalanced stating that "If suction bucket or gravity- based foundations are used the footprint of these structures would likely be larger than monopile or piled jacket resulting in greater benthic mortality." [Footnote 35: Draft PEIS at 3.5.2-28] Here BOEM does not mention that this impact may not be permanent and the larger areas provided by these foundation types would provide hard substrate for benthic colonization which may increase local biodiversity. In the PEIS BOEM should fully acknowledge and incorporate the potential for all types of ecological effects associated with the use of suction bucket or gravity-based foundations. In general BOEM's review and approval process should accurately evaluate the environmental impacts of project-related actions thereby providing a clear view of the full range of effects of environmentally responsible design alternatives such as quiet foundations without inadvertently precluding or discouraging their adoption.	
BOEM-2024-0001-0451-0002	While we support the continued use of a PDE in formulating alternatives we encourage BOEM to broaden its parameters in the PDE and avoid coupling specific AMMMs to specific PDE parameters. Both of these exercises will work towards making the PEIS a useful tool for the NYB leases and establishing a standard practice for developing offshore wind lease PEISs going forward.	As described in Section 2.1.2.1, the RPDE in the PEIS was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. The RPDE is not meant to be prescriptive and includes a range of parameters that is representative of development that could occur associated with any of the six NY Bight lease areas. Based on this, BOEM believes the RPDE is appropriate and sufficiently broad for purposes of the PEIS. Regarding coupling AMMM measures to specific RPDE parameters, BOEM developed the AMMM measures to be

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		programmatic so that they could be applied to any of the six NY Bight lease areas. Generally speaking, AMMM measures are not tied to any specific RPDE parameter. BOEM has considered all comments received on AMMM measures and has made several changes to the AMMM measures as presented in the Final PEIS Appendix G.
BOEM-2024-0001-0452-0003	III. Scope of RPDE and Six Project Analyses The Representative Project Design Element (RPDE) used in the PEIS assesses a broad range of project components; a range of 50-280 turbines seabed footprint with associated scour protection of 0.24-2.88 acres 1-5 offshore substations interarray cabling of 33-550 miles and 1-9 export cables. These wide ranges of project elements for a single lease frustrate any nuanced analyses and comparison between Alternative B - Defer Adoption of AMMM measures and Alternative C - Proposed Action Adoption of AMMM Measures. The PEIS uses "scaled" parameters for analysis of the 6 projects (leases) in the NY Bight which are "up to 1103 WTGs 22 OSSs 44 offshore export cables totaling 1772 miles (2852 kilometers) and 1582 miles (2546 kilometers) of interarray cables. The values for these parameters were provided by the NY Bight lessees or were calculated by BOEM based upon information provided by the lessees and represent the maximum number/length of WTGs OSSs and cables that would be developed for the six NY Bight projects." [Footnote 12: Draft PEIS p. 2-16.] It is unclear how BOEM landed on these scaled parameters because they are not based on extrapolation of the RPDE; the agency must clarify how these assumptions were made. If external factors such as power contracts or return on investments for developers are the base case for the draft PEIS then BOEM has failed to provide neutral environmental review which is the clear goal of an PEIS.	As described in Section 2.1.2.1, the RPDE in the PEIS was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey, and it was prepared before lessees submitted COPs for BOEM review. The RPDE includes a range of representative parameters of offshore wind development in the NY Bight. The RPDE contains a minimum and maximum value for most parameters or multiple options that could be selected to provide bounds for the analysis. Because the RPDE covers six lease areas of differing sizes and was developed before lessees submitted their COPs, a wide range of potential parameters was used to ensure the maximum potential impacts from development in the NY Bight could be assessed. Regarding the parameters for six NY Bight lease areas, as noted in Section 2.1.2.2, the values for these parameters were provided by the NY Bight lessees or were calculated by BOEM based upon information provided by the lessees, and they represent the maximum number/length of WTGs, OSSs, and cables that would be developed for the six NY Bight projects. The six project parameter values were not calculated by multiplying the one project RPDE by six because this method would have significantly overestimated number/size of project features as the one project RPDE is based on the maximum value for all six of the NY Bight lease areas (i.e., largest project, largest lease area). Instead, lessees informed BOEM about the maximum potential buildout that could occur across the six lease areas, which BOEM then evaluated as part of the RPDE for six projects. Using information provided by lessees to inform the RPDE is the same way BOEM receives and analyzes information for individual COPs—lessees design their project and BOEM analyzes the projects as proposed.

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BOEM-2024-0001-0470-0009	[Italics: b) The Disclosed/Analyzed Buildout Capacity is Completely Insufficient for Known Service Obligations] The New York Independent System Operator Inc. ("NYISO") presents load and capacity data for 2023 and future years in its annual "Gold Book." The [Underline: 2023 Gold Book] includes forecasts through to 2053 for electricity demand throughout the state known the New York Control Area or "NYCA." As summarized by the NYISO on page 22 of the Gold Book and shown in Table 2 the annualized forecast for demand growth in the NYCA [Bold: will grow by 55% from the current 150000 GWh to 235020 GWh be- tween 2023 and 2053.] Notably Table 2 indicates that after 2030 the greatest growth in demand for end-use electric energy in the NYCA will be building electrification and electric vehicles (EVs). An additional 49260 GWh will be needed to power EVs a factor of ten over the established rail electric transportation systems operating in the northeast corridor operation of which currently uses more than half of the existing wind production in those same states (Table 3).[Table 3: Wind Output and Mass Transit Electricity Requirements - Northeast Corridor]NE Corridor State: MA; Wind Output (GWh): 0.215; Mass Transit System: MBTA; GWh Used: 0.422NE Corridor State: RI; Wind Output (GWh): 0.209; Mass Transit System: Blank; GWh Used: BlankNE Corridor State: CT; Wind Output (GWh): 0.013; Mass Transit System: CTrail; GWh Used: U/ANE Corridor State: NY; Wind Output (GWh): 4.567; Mass Transit System: NYMTA; GWh Used: 2.800NE Corridor State: NJ; Wind Output (GWh): 0.022; Mass Transit System: NJT; GWh Used: 0.300NE Corridor State: PA; Wind Output (GWh): 3.572; Mass Transit System: SEPTA; GWh Used: 0.386NE Corridor State: MD; Wind Output (GWh): 0.497; Mass Transit System: MARC; GWh Used: U/ANE Corridor State: DE; Wind Output (GWh): 0.004; Mass Transit System: Blank; GWh Used: BlankNE Corridor State: DC; Wind Output (GWh): 0; Mass Transit System: WMATA; GWh Used: 0.500NE Corridor State: Interstate; Wind Output (GWh): Blank; Mass Transit System: AMTRAK; GWh Used: 0.636NE Corridor State: Total; Wind Output (GWh): 9.099; Mass Transit System: Blank; GWh Used: 5.044[Table End][Bold: Source: US EIA]	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to identify AMMM measures that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. The PEIS does not approve any projects. The purpose and need further states the PEIS supports federal goals of 30 GW and state goals, but it is not intended to meet state obligations. BOEM's leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals.

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BOEM-2024-0001-0528h	I will also note that BOEM's PEIS design envelope is completely ridiculous. You know, 50 turbines to 200 something turbines is not a project design envelope. That's that precludes any meaningful analysis. And from what I can see so far, the PEIS does preclude any meaningful analysis. And that is a huge problem. You can't conduct a NEPA analysis on something that's 50 or 250. That's not realistic.	The RPDE for the PEIS includes a range of representative parameters of offshore wind development in the NY Bight, as described in Section 2.1.2.1. Each COP submitted within the NY Bight will be required to identify the proposed spacing, turbine height, rotor diameter, and other parameters of the project. Regarding the wide range of parameters, the RPDE was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. Because the RPDE covers six lease areas of differing sizes and was developed before lessees submitted their COPs, a wide range of potential parameters was used to ensure the maximum potential impacts from development in the NY Bight could be assessed.

P.5.23 Mitigation and Monitoring

Table P.5.23-1. Responses to Substantive Comments on Mitigation and Monitoring—General AMMM Comments

Comment No.	Comment	Response
BOEM-2024-0001-0331-0012	Regarding mitigation measures included in the PEIS we question how they are barely adequate given that the document ignores the cumulative impact of all offshore wind projects in the NJ/NY area as well as all the projects off the east coast. We also question how the monitoring will be handled the cost of the monitoring the labor involved in the monitor and how the monitoring processes will be evaluated. Not all mitigation measures are effective for all species. How does mitigation work when a number of suggested activities are voluntary? Lastly how can mitigation measures be implemented if data is not available to show what the impacts area?	BOEM has updated the alternatives analysis and not all AMMM measures are being recommended as T&Cs; many are staying RPs. BOEM revised Alternative C to distinguish between AMMM measures that have been previously applied and those that have not been previously applied. The RPs are not analyzed within the alternatives analysis. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information. Revised, additional, or different mitigation measures can also be considered at the project-specific COP NEPA review stage when project details are known.
BOEM-2024-0001-0342-0001	The Commission would first like to commend BOEM on the thoroughness and succinctness of the draft AMMM measures for marine mammals. The proposed incorporation of the AMMM measures into the required terms and conditions for approval of future wind energy development projects in the New York Bight lease areas will help to ensure consistency in implementation as these projects move forward. They also will serve as a basis to harmonize with mitigation monitoring and reporting measures that would be required by the National Marine Fisheries Service (NMFS) in its authorizations governing the taking of marine mammals incidental to conducting wind energy construction operation and decommissioning activities in the New York Bight as required under the Marine Mammal Protection Act.	Thank you for your comment.
BOEM-2024-0001-0347-0005	Thank you for your consideration of these comments. ASGA's support for the aforementioned AMMMs does not necessarily indicate our approval of this industry but rather seeks to improve the development of OSW as it relates to marine ecosystems and fishing communities. ASGA looks forward to following the application of the programmatic approach in this region and hopes that assessing and mitigating cumulative impacts in the NY Bight will be a priority of BOEM and OSW developers. If we can be helpful or answer additional questions please do not hesitate to reach out.	Thank you for your comment.

Comment No.	Comment	Response
BOEM-2024-0001-0352-0002	General comments on the draft PEIS. We generally support the concepts of programmatic analysis and adoption of programmatic AMMM measures. Requiring the same AMMM measures across all six New York Bight projects might create efficiencies in the subsequent stages of the environmental review process including EFH consultations for both reviewing agencies and the public. However for the reasons described below we are uncertain as to the usefulness of the PEIS as a decision support tool. Given that this PEIS is intended to support BOEM's decision making regarding adoption of programmatic AMMM measures it is not clear why the document lists and considers the impacts of several AMMM measures which BOEM does not have the authority to implement or which are described as voluntary. For example the draft PEIS states "not all of these AMMM measures are within BOEM's statutory and regulatory authority; those that are not may still be adopted and imposed by other governmental agencies" (page G-1). We appreciate that the action/enforcing agency is identified for each AMMM measure; however it is not clear why measures that cannot be adopted by BOEM are included in the draft PEIS at all. This should be clarified in the final PEIS.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. Many of the measures are now identified as RPs.
BOEM-2024-0001-0352-0003	It can be assumed that several AMMM measures listed in Appendix G will be implemented for each of these projects based on BOEM guidance or regulations interagency agreements (e.g. the NOAA and BOEM fisheries survey mitigation agreement) or requirements that have been implemented for previously approved projects. This includes but is not limited to COMFIS-1 (compensation for gear loss and damage) COMFIS-5 (fishery survey guidelines) COMFIS-6 (fisheries compensatory mitigation) MUL-14 (UXO avoidance) and most aspects of MUL-25 (consistent turbine layout markings and lighting). Other listed AMMM measures are novel or are not presumed to the same extent including COMFIS-3 (scallop monitoring plan) many components of COMFIS-4 (fisheries mitigation) and notably MUL-18 (shared transmission corridor). We recommend that the final PEIS more clearly distinguish AMMM measures that must or are assumed to be implemented to meet existing requirements and agreements from additional measures that could be adopted but are not required. The draft PEIS attempts	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. The RPDE is a range of technical parameters that describe a wind energy project that could occur in any of the six NY Bight lease areas. Most parameters contain a minimum and maximum value or multiple options that could be selected to provide bounds for the analysis. In general, the maximum values in the RPDE represent the maximum scenario of development that could occur in any of the six NY Bight lease areas, and are what the analysis in the PEIS is based on. Additionally, the RPDE is not meant to be prescriptive or to establish limits for future development, as new and emerging offshore wind technologies that have not yet been proposed in existing COPs or analyzed in the RPDE may be part of the development scenario for the NY Bight lease areas. The PEIS can be used for tiering for project-specific COP NEPA reviews.

Comment No.	Comment	Response
	to evaluate a vast matrix of interactions and issues. Given the very long list of AMMM measures the large number of impacted resources and the complexity of the potential project design envelopes (PDEs) across a range of projects this is an inherently challenging exercise to execute effectively. Refinement of the list of AMMM measures considered in the final PEIS could help to improve the utility of the document. Limiting the number of AMMM measures considered in the final PEIS to those that are not already very likely to be required by regulation or guidance and are within BOEM's purview would make it easier to evaluate the incremental benefits of each AMMM measure on individual impacted resources. As it stands now the very general impacts discussion and long list of AMMM measures makes it hard to assess the benefits of any individual measure. This undermines the usefulness of the PEIS as a decision-making tool for selecting the best and most impactful AMMM measures. We appreciate that the purpose and need section does not state that programmatic AMMM measures will only be adopted if wind projects in these lease areas are still capable of producing a certain amount of electricity. In previous comments on draft EIS documents for other wind projects we opposed closely tying state and federal goals to the purpose and need statements as this restricted consideration of modifications to avoid and minimize negative impacts to the environment and human communities. Clearly defined project parameters in the PEIS could help provide efficiencies for subsequent reviews. However as we have noted in previous project-specific comments broad project design envelopes pose a challenge for stakeholder and agency consultation and comments. We are concerned that is the case here; for example while the PEIS focuses on two foundation types all foundation types are within the range of the PDE and different installation methods indicate different mitigation requirements are needed to avoid impacts. If any of the range of values in the PDE are outside those likely to be recommended for projects in these lease areas we recommend narrowing the PDE. We recognize this may not be feasible. If certain design choices have a large effect on anticipated impacts we suggest highlighting these features in the impacts analysis.	

Comment No.	Comment	Response
BOEM-2024-0001-0406-0001	1. BOEM's Proposed AMMM Measures Extend Beyond What is Generally Accepted. Instead of focusing on a core set of generally applicable "tried and true" mitigation measures BOEM is using the Draft PEIS to solicit comments on a wide spectrum of novel and untested measures contained in Appendix G many of which are commercially technically and legally problematic.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0406-0014	IV. BOEM Must Reconsider Its Approach to the List of Proposed AMMM Measures BOEM's proposed list of AMMM measures the heart of the Draft PEIS is flawed in its volume scope and substance. The Draft PEIS includes in Appendix G a 36-page table with 119 AMMM measures 71 of which BOEM acknowledges have not been implemented in the proposed form in any of the previously approved COPs. A programmatic EIS is not the proper venue to test novel impact mitigation concepts let alone such an extensive array of them. Moreover as set forth in more detail below many of these AMMM measures are technically infeasible or would impose financial burdens on projects that are both substantial and disproportionate to the benefits provided by the implementation of these AMMMs both individually and cumulatively. For reasons set forth in Sections II and III above BOEM should refrain from "adopting" any of the AMMM measures in the Final PEIS and instead commit to "considering" them in the PEIS or at the COP stage of review as appropriate in accordance with the revised alternatives described in those sections. Further we urge BOEM to reconsider its approach to the evaluation of AMMM measures to (i) focus on those that are most proven feasible and effective (ii) consider those that may be warranted but have not previously been proven feasible or effective and (iii) exclude those that are infeasible not practicable overly vague or difficult to enforce outside of BOEM's jurisdiction or otherwise inappropriate. The PEIS should focus its analysis of AMMM measures on a subset of those listed in the Draft PEIS that have been previously used in other COP approvals and which are widely acknowledged by agencies and industry as proven feasible effective and appropriate for all projects. These "Core AMMM measures" should be considered for all NYB projects that seek to tier off of the Final PEIS. On the other hand a number of the AMMM measures should be dropped from further consideration because	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.

Comment No.	Comment	Response
	they simply are not viable (the "Non-viable AMMM measures"). This includes any measures that fall into one or more of the categories described in Section IV.b of this letter below and may include others based on experience and input provided by the regulated community. The remaining AMMM measures those that are neither Core nor Non-viable should be treated as a "Menu" of measures that the lessee may consider including in their individual COPs. BOEM would incorporate by reference into its COP NEPA reviews the analysis from the PEIS of those measures or any measures from the Menu of AMMMs that it determined to be necessary and appropriate conditions for approval of a specific COP. As the effort to finalize the PEIS continues we are committed to meeting and working with BOEM as well as other lessees to identify which measure are appropriate for inclusion in each of the three categories identified here.	
BOEM-2024-0001-0406-0015	a. The Volume of AMMMs Presents a Cumulative Burden on COSW and Other Developers As a threshold matter the sheer number of AMMM measures included in the Draft PEIS presents an unwarranted and unnecessary burden for the NYB projects. We appreciate that a rigorous NEPA analysis should take a hard look at the environmental consequences of the proposed action. However it is not necessary to evaluate an exhaustive list of all conceivable options particularly before any COP has been submitted. NEPA compels only "a reasonably complete discussion of possible mitigation measures." Methow Valley Citizens Council 490 U.S. at 352. CEQ guidance urges agencies to "apply professional judgment and the rule of reason" when determining mitigation and monitoring measures." CEQ Mitigation and Monitoring Guidance 10 (Jan. 2011). We urge BOEM to review the expansive range of AMMM measures that it proposes to "adopt"[Footnote 5: Please see our discussion in section II.a above of this comment letter regarding the legal infirmities of any "adoption" of AMMMs in the PEIS.] in the PEIS and evaluate the necessity and practicability of each measure individually as well as consider whether the aggregate burden that would result is commensurate with the overall level of anticipated impacts that the measures are intended to reduce. We are concerned that the	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.

Comment No.	Comment	Response
	implementation of all of these measure could place an undue burden for a diminished result and potentially impact project viability.	
BOEM-2024-0001-0406-0016	b. Many of BOEM's Proposed AMMM Measures Are Infeasible Inappropriate Unenforceable and/or Duplicative A significant number of the individual AMMM measures proposed in Appendix G are fatally flawed. For ease of discussion most of these objections can be sorted into the following non-exclusive and often overlapping categories of concerns. The measures listed below are all Non-viable AMMM measures. This list however is intended to be representative and not exclusive. As noted throughout these comments COSW is committed to working with BOEM and others to focus and identify the list of technically and commercially feasible AMMM measures which we propose be carried forward in the PEIS. The experience of those who have developed and operated offshore wind projects and implemented different measures in particular will be instructive in identifying which proposed measures are Non-viable.	Thank you for your comment.
BOEM-2024-0001-0406-0030	c. Revised List of AMMM Measures Based on the concerns raised in Section IV above BOEM should reduce the final list of AMMM measures in Appendix G to the Core AMMM measures plus a Menu of additional AMMM measures that have been determined to be potentially viable based on BOEM's own analysis and critically input received from the NYB lessees. The experience of those who have developed and operated offshore wind projects and implemented different measures in particular will be instructive in identifying which proposed measures are non-viable. This approach of focusing the list of AMMM measures by removing those that are Non-viable and then identifying Core and Menu measures will avoid introducing unvetted and untenable concepts into the potential terms and conditions for COP approvals without barring BOEM from considering additional viable measures beyond the Core measures in individual COP reviews where necessary and appropriate. This approach also would avoid creating a presumption that BOEM will incorporate the full list of AMMM measures wholesale into each NYB COP approval. Ultimately a more carefully selected list of AMMM measures will both support and ensure responsible development and operation of offshore wind in the NYB. COSW is committed to meeting and working with BOEM as well as other lessees to	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.

Comment No.	Comment	Response
	efficiently revise the list of AMMM measures and identify those appropriate for including in three categories identified in these comments.	
BOEM-2024-0001-0406-0004	3. BOEM's Proposed Action Illegally Changes the Standard of Review for NYB Projects. By proposing to "adopt" its list of AMMM measures as "require[d] conditions of approval" before receiving any NYB COPs BOEM illegally converts NEPA from a procedural statute into a substantive one. The proposed action would also de facto modify BOEM's own regulations by shifting the burden to lessees to demonstrate in their COPs that a pre-determined set of AMMM measures is not "warranted or effective."	The Proposed Action in the Final PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. BOEM may require some or all of these measures as conditions of approval for activities proposed by lessees in COPs submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. The purpose of the Proposed Action is to describe issues, analyze degree of potential impacts, and identify, as appropriate, AMMM measures. This PEIS does not, by itself, impose any mitigation measures on future COPs. This PEIS is therefore not the consummation of the agency's decision-making for these measures as applied to specific COPs. BOEM intends to use AMMM measures identified at the programmatic stage to inform the selection of appropriate AMMM measures at the COP decision stage.
BOEM-2024-0001-0406-0006	3. Modifying the proposed action to eliminate the "adoption" of AMMM measures and instead reframing the action as analysis of the RPDE with implementation of the core measures. This change would avert legal exposure for BOEM and the NYB lessees while still resulting in a document that facilitates tiering of the NEPA analysis. With these essential modifications the Final PEIS can achieve BOEM's objectives without crippling the technical and commercial viability of offshore wind development in the NYB or jeopardizing progress toward national and state offshore wind targets. In the sections that follow we provide more detail on each of these key issues and our proposed resolution.	Refer to responses to comments BOEM-2024-0001-0317-0016, BOEM-2024-0001-0406-0004, and BOEM-2024-0001-0331-0012.

Comment No.	Comment	Response
BOEM-2024-0001-0406-0007	BOEM can readily resolve these flaws by making the following changes in the Final PEIS: 1. Working with the NYB lessees to focus the list of AMMM measures in Appendix G and eliminate those that are technically or economically infeasible outside of BOEM's jurisdiction overly vague or difficult to enforce or otherwise inappropriate for inclusion or consideration in the PEIS. The remaining AMMM measures should be divided into two separate categories respectively consisting of (i) "Core" measures that have been vetted with the input of industry and are deemed warranted for all leases and (ii) measures that are potentially viable but that may not be warranted or commercially or economically feasible in all cases. Collectively the AMMM measures in this second category should be placed aside as a "Menu" of additional measures that BOEM or project proponents may consider adopting at the COP NEPA review stage. The remaining measures included in the Draft PEIS ("Non-viable" measures) should be excluded from Appendix G in the Final PEIS and dropped from further consideration.	Refer to responses to comments BOEM-2024-0001-0317-0016, BOEM-2024-0001-0406-0004, and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0422-0002	Feasibility As indicated in Attentive Energy's comments below regarding specific AMMMs there are multiple instances where the proposed AMMM is unclear and/or infeasible to implement. Attentive Energy identifies where there are concerns regarding the feasibility of implementation per the analysis of each AMMM and attempts to clarify its concerns and questions.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. The difference between AMMM measures and RPs has been clarified in the Final PEIS.
BOEM-2024-0001-0423-0002	Turning our attention to the substance of the Draft PEIS Ocean Winds expresses two fundamental areas of concern. The first is that the process through which the Draft PEIS was developed was imprecise in that the range of impact determinations per resource was often so broad that it left the ensuing analysis and mitigation measures without clear scientific basis. The second is that many specific Avoidance Minimization Mitigation and Monitoring measures (AMMMs) proposed in the PEIS are beyond the jurisdiction of BOEM are duplicative of mitigations already required by other agency approvals are technically infeasible or are overly broad and will inappropriately delay and hinder offshore wind development. As discussed further below Ocean Winds believes our concerns can be met by the following actions: 1. Limiting AMMMs in the Final PEIS to those that are	Refer to responses to comments BOEM-2024-0001-0317-0016, BOEM-2024-0001-0406-0004, BOEM-2024-0001-0352-0003, and BOEM-2024-0001-0331-0012. BOEM analyzed potential climate change impacts on each resource as a part of the ongoing and future conditions under the No Action Alternative.

Comment No.	Comment	Response
	(a) within BOEM's jurisdiction (b) are demonstrated by the PEIS to mitigate known impacts of all covered six projects in the New York Bight (c) do not add additional reports during the COP review stage as changes to the COP requirements should be done via updates to COP guidance or regulations and (d) do not add new plans and reports that duplicate mitigations that would already be required by other federal approvals or state approvals; 2. Including thorough analyses in the Final PEIS that demonstrates the need for and benefits of "new" AMMMs over those included in prior Records of Decision (RODs)/ Environmental Impact Statements for COPs of prior approved projects by adding an Alternative that applies the 48 AMMMs included in prior RODs; 3. Ensuring that all AMMMs are proportionate to the demonstrated impacts in the PEIS; 4. Clearly noting where additional information from COP-specific analysis is necessary to determine impacts and waiting for individual project COPs to consider AMMMs (rather than pre-proposing AMMMs that may not be applicable to individual projects or may not fit the level of impact determined); and lastly 5. Considering any possible impacts in the context of ocean waters warming due to climate change and the ways in which the deployment of significant quantities of offshore wind generation will help mitigate such impacts.	
BOEM-2024-0001-0423-0003	A. Broad Concerns 1) The purpose of the Proposed Action as described in Draft PEIS Section 1.3 is the[italicized: "adoption of programmatic AMMM measures that BOEM would require as conditions of approval for activities proposed by the lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective."]Ocean Winds agrees with the fundamental principle described in the American Clean Power comment letter which specifies that the adoption of AMMMs through the PEIS is an improper use of NEPA. NEPA can only analyze impacts of adopting or not adopting measures and BOEM's proposed action to "adopt"	1) Refer to response to comment BOEM-2024-0001-0406-0004. 2) Refer to response to comment BOEM-2024-0001-0317-0016 3) Refer to response to comment BOEM-2024-0001-0331-0012. 4) Refer to response to comment BOEM-2024-0001-0352-0003. Project-specific details will be analyzed at the COP-specific NEPA stage. The PEIS is a conservative approach to identifying potential impacts. The intent of Alternative B has been clarified in the Final PEIS.

Comment No.	Comment	Response
	AMMMs through the PEIS process is contrary to BOEM's authority under the Outer Continental Shelf Lands Act and to NEPA. The purpose and need section of the PEIS states an unfounded presumption that all AMMMs are warranted across all projects and thus would be adopted in their RODs. It thus puts the burden on the developer and BOEM to demonstrate that they are not warranted. In this way the Draft PEIS would place significant new burdens on offshore wind without having demonstrated that the measures required for prior projects which were put forward after years of analysis and consideration are in any way inadequate. 2) Of the 113 AMMMs proposed in the Draft PEIS BOEM identified 65 of the AMMMs that have never been applied in prior projects RODs. In addition the science and data driving many of the new AMMMs is not clearly outlined in the Draft PEIS. Including these inadequately supported AMMMs in the PEIS creates a vague expectation that they will be applied to all developers as it is impossible to say they are inapplicable given the lack of justification for them in the documentation provided with the Draft PEIS (some examples of which are discussed in the next two sections). Further the extensive list of new AMMMs could encourage the filing of unfounded legal challenges by creating the impression that such measures are needed despite the lack of evidence for such a need. The bottom line is that the additional AMMMs included in the Draft PEIS should not be applied to all projects pre-COP submittal but rather should be assessed in project-specific NEPA reviews which consider why the existing suite of AMMMs issued in past RODs are insufficient. 3) There is a lack of clarity in the process of how the AMMMs would be applied. For example there are a large number of AMMMs that increase reports needed during the COP review stage. Creating a requirement for projects to provide additional reports cannot and should not be done through AMMMs in a NEPA PEIS. There is no indication how these requirements would be applied to lessees currently preparing COPs. This mirrors the lack of clarity regarding how a lessee would demonstrate that AMMMs are inapplicable and how BOEM would make a determination if they were. It is unclear how these AMMMs could or would be able to be changed post-PEIS	

Comment No.	Comment	Response
	ROD if they are unsuitable for a project. There are also a number of AMMMs labelled as "voluntary" but give no indication of when and how they should be included in the project-specific COPs 4) A number of assumptions in the PEIS are unrealistic. For example BOEM assumes all six projects would be constructed at once. This is impossible given any number of factors including the availability of vessels the constraints of the supply chain and the fact that projects have already specified different completion dates through various offtake awards issued in NY and NJ. Thus impacts connected to an "all at once" scenario are unrealistic. An additional flawed assumption is that Alternative B appears to assume the six projects will be constructed without mitigation. Ocean Winds believes this was done to create a comparison between that circumstance and Alternative C however a more realistic Alternative should be added which assumes that the NY Bight projects would be built with the mitigation measures applicable to each site in-line with AMMMs already applied in other COPs. Further the range of impact determinations per resource is so broad that it would be difficult to measure the effect of the AMMMs proposed. For example commercial recreational fishing impact ranges from negligible to major for Alternative B and negligible to moderate for Alternative C. BOEM must narrow those impact ranges or if a clear impact determination cannot be made defer the application of AMMMs to a COP-specific EIS. The AMMMs applied and their level of severity need to match the impact determinations. If there isn't enough information to make a clear and scientifically based determination regarding an issue or concern then it is inappropriate to craft an AMMM to address that issue or concern. Lastly alternations to project design such as removal of wind turbine generators is proposed in several AMMMs. This is not an appropriate use of a programmatic document and should only be applied as a last resort on a COP-specific basis where no other mitigation measure will work. Overall we see more risk of this PEIS lengthening the overall timeline because of the need to clarify the process and the need to cross check the COPs with the PEIS.	

Comment No.	Comment	Response
BOEM-2024-0001-0436-0010	V. AMMMs Invenergy appreciates BOEM's desire to demonstrate innovation in pursuit of more effective and efficient AMMMs. Unfortunately the PEIS includes many new AMMMs and modifications to past measures that have not been discussed with industry experts or developed through an agency consultation process as part of a COP assessment. This failure to confer with project sponsors in the development of AMMMs is inconsistent with the purpose and need for the PEIS and the Fiscal Responsibility Act amendments to NEPA providing for project sponsor involvement in the environmental review process. Although not binding the Draft PEIS as written puts developers in a difficult position to walk back adoption of the AMMMs.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. The difference between AMMM measures and RPs has been clarified in the Final PEIS.
BOEM-2024-0001-0436-0013	c. COP Guidance Some of the new AMMMs are not appropriate for the PEIS since they dictate how a COP should be developed and therefore by their very nature could not be implemented through terms and conditions of COP approval. By requiring that a measure be demonstrated through initial COP submission BOEM is in effect creating COP guidance. The New York Bight PEIS is not the proper venue for BOEM and cooperating agencies to develop COP guidance because general COP guidance development is outside of the scope of the Notice of Intent for the New York Bight PEIS. Instead of using this area specific PEIS as the basis for revision of general COP guidance BOEM should follow its regular processes to develop COP guidance to ensure that all stakeholders have the opportunity to weigh in on items that will impact development beyond the New York Bight. Further the timeline for the New York Bight PEIS ROD will not allow industry to adequately implement such AMMMs without significant project delays for COP revisions (again counter to the purpose and need for the PEIS). Consistent with the purpose and need of providing AMMMs for incorporation into New York Bight COPs Invenergy recommends that all measures that constitute COP guidance be categorized as such in the Final PEIS and given further consideration by BOEM through a separate public review and stakeholder outreach process outside of the PEIS.	AMMM measures in the Final PEIS have been updated to remove requirements associated with COP submissions. Mitigation will still need to be included as part of the COP-specific NEPA analysis.
BOEM-2024-0001-0436-0016	f. AMMM Treatment in the Final PEIS Invenergy agrees that those AMMMs that have been previously applied as a COP term and condition or otherwise been tested to confirm technical and	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. The difference between AMMM measures and RPs has been clarified in the Final PEIS.

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	economic feasibility warrant adoption in the Final PEIS and can be applied to future projects in the New York Bight. Importantly however the Final PEIS should outline a reasonable process for project-specific deviations to adopted AMMMs that could result from circumstances such as technological improvements and site-specific conditions. Overly prescriptive programmatic AMMMs that lack procedural flexibility could serve to disincentivize innovation that is necessary for an effective program for reducing project-related environmental impacts. The Final PEIS should allow lessees to propose alternative AMMMs in their COPs that achieve the same or better resource outcomes. Invenergy acknowledges that the new AMMMs presented in the Draft PEIS were likely recommended by cooperating agencies stakeholders and the public. We believe that most of these new measures have an appropriate place in the Final PEIS but that treatment must be something other than firm requirements for all future New York Bight projects. We urge BOEM to work with the six New York Bight lessees to implement the recommended clarification and classification of new AMMMs in the Final PEIS described below.	
BOEM-2024-0001-0436-0017	As stated previously Invenergy recommends BOEM set aside those new AMMMs that constitute COP guidance and address them through a separate process outside of the PEIS. Invenergy also recommends that AMMMs that fall under the authority of another agency be classified as such and deferred to the appropriate permit or consultation process rather than duplicated via the PEIS. Invenergy further recommends that all remaining new AMMMs identified in the Draft PEIS inclusive of those measures that have been adopted in recent COPs but not tested be presented in the Final PEIS as a menu of pre-reviewed options with standard language for incorporation into COP-specific NEPA reviews. Application of these new AMMMs may be warranted based on project-specific circumstances that are revealed through project reviews (rather than assumed to apply at the programmatic level shifting the burden to prove otherwise to the lessee). This pick list of measures will be pre-vetted by BOEM and cooperating agencies and analyzed as part of Alternative C making adoption in future COP-specific NEPA reviews more efficient. Further evaluation at the COP-specific level will	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. AMMM measures in the Final PEIS have been updated to remove requirements associated with COP submissions. Mitigation will still need to be included as part of the project-specific COP NEPA analysis.

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	ensure that each measure has an appropriate and necessary nexus to an identified and reasonably anticipated effect that warrants mitigation and that the measure is proportional to the identified effect as well as feasible in implementation. This will also allow BOEM to adequately balance the environmental benefits and risks based on project-specific factors.	
BOEM-2024-0001-0436-0020	Appendix C is less helpful with regards to the AMMMs which are drafted with inconsistent phrasing that confuses how they should be applied (e.g. "must" "should" "encourage"). Invenergy encourages BOEM to implement consistent phrasing for the AMMMs that provides clarity on how they will be applied in accordance with our recommendations above. The Appendix C description of AMMMs also does not provide a process for project-specific deviations. The revised treatment of AMMMs as recommended in Section V of this letter should be fully integrated into Appendix C in the Final PEIS including identification of which AMMMs are required how deviations in both AMMMs and the PDE will be addressed and how new AMMMs can be applied to COP-specific NEPA reviews when warranted.	Refer to responses to comments BOEM-2024-0001-0317-0016, BOEM-2024-0001-0406-0004, and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0439-0019	b. BOEM should remove AMMMs that would be more appropriately proposed as COP development guidance. Several AMMMs would in effect establish new COP development guidance. The inclusion of these measures is counter to the proposed action which states that "BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective."[Footnote 43: Draft PEIS ES-3.] These measures dictate how a COP should be developed and therefore by their very nature could not be implemented through terms and conditions of COP approval as at that time the COP is already fully developed and analyzed under NEPA and other environmental laws and consultations. For example MUL-23 which states that "Lessees must consider how to avoid or reduce potential impacts on important environmental resources including sensitive habitats (e.g. Mid-Shelf Scarp NJDEP-designated prime fishing grounds hardbottom SAV ledges) by adjusting project design. Lessees must demonstrate this consideration through their initial COP	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. AMMM measures in the Final PEIS have been updated to remove requirements associated with COP submissions. Mitigation will still need to be included as part of the project-specific COP NEPA analysis.

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	submission or subsequent updated versions." Requiring that a measure be demonstrated through initial COP submission is COP guidance and as stated above could not be implemented through terms and conditions of plan approval and is therefore in direct conflict with the proposed action. This measure and all AMMMs that constitute COP guidance should be removed and not included in the Final PEIS. Instead BOEM can include these measures in a narrative that discusses items that should be studied separately through the development of future guidance what feedback was provided on these items and how BOEM would seek further input on them through a formal guidance public review process. If BOEM would like these measures to be included in the COP development process then BOEM must go through the proper guidance development process. To do so BOEM would need to amend the current COP guidance to include these measures and go through a public review and stakeholder outreach process. A NEPA document that focuses on specific leases should not be the venue for BOEM (and cooperating agencies) to receive stakeholder feedback on COP guidance. It is important that BOEM utilize the correct processes to ensure consistency with the purpose of the PEIS and give proper notice to all stakeholders given that these proposed measures are highly likely to impact development beyond the NY Bight.	
BOEM-2024-0001-0439-0002	BOEM should reframe the PEIS as an analysis of AMMMs rather than as a vehicle for mandating AMMMs.	Thank you for your comment.
BOEM-2024-0001-0439-0021	d. BOEM should remove AMMMs that are voluntary. In Appendix G BOEM lists numerous AMMMs as "voluntary." In addition to any other reason these measures are otherwise inappropriate (as set forth in Attachment A) BOEM should not analyze any of these measures as potential terms and conditions of plan approval. Doing so would undermine the voluntary nature of the measures.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0439-0022	e. Any AMMMs That End Up In the Preferred Alternative Should Be Backed By Evidence of their Effectiveness. The final PEIS should demonstrate that each AMMM ultimately included in the preferred alternative results in avoidance or substantial reduction of impacts and is based on science. Indeed BOEM notes in the PEIS that "There should also be evidence that each alternative would avoid or	Refer to responses to comments BOEM-2024-0001-0317-0016, BOEM-2024-0001-0352-0003, and BOEM-2024-0001-0331-0012.

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	substantially lessen one or more potential specific and significant socioeconomic or environmental effects."[Footnote 46: Draft EIS 2-1.] BOEM should demonstrate this reduction in impacts before considering an AMMM in its preferred alternative. However as drafted the PEIS does not appear to show an appreciable difference in impacts between Alternative B and Alternative C for many of the resource areas (Table ES-2 and Table 2-4). Moreover for many AMMMs BOEM fails to demonstrate that proposed mitigations would result in change in impact from the application of the AMMM stating that impacts of Alternative C are anticipated to be the same or similar to Alternative B. In fact the PEIS only has five resource areas that show appreciable reduction in impacts between Alternatives B and C. Even for those five areas several only show reductions if the 6 NY Bight projects are built in the same year- a highly unlikely outcome as discussed below. In addition as discussed previously Alternatives B and C are not reasonable as one drastically overestimates impacts while the other considers technically and economically infeasible mitigation measures. A true comparison among reasonable alternatives is key to determining the effectiveness and appropriateness of mitigation measures. Finally the PEIS fails to analyze or demonstrate specific impacts of offshore wind development in the NY Bight on resources for which it proposed mitigation measures. Mitigation measures should avoid minimize or compensate for effects caused by a proposed action or alternatives as described in an environmental document or record of decision and that have a nexus to those effects.[Footnote 47: 40 CFR 1508.1(s)] For many AMMMs the PEIS fails the very basics of applying mitigation measures as there is no demonstrated effect caused by the proposed action or alternatives it is not specifically described in the document and no clear nexus between the mitigation measure and those effects is demonstrated. Attachment A contains more detailed comments on these and other measures that fail to demonstrate impacts on resources and effectiveness of AMMMs.	

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BOEM-2024-0001-0439-0006	BOEM should remove from consideration certain listed AMMMs including: • AMMMs that are not true mitigation measures but instead augment existing COP guidance or substitute for new regulations. If BOEM believes these measures merit further consideration the agency should do so by seeking full public input through revisions to COP guidance or a rulemaking. • AMMMs that are technically or economically infeasible. • AMMMs that are outside BOEM's jurisdiction and • AMMMs that are voluntary.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0440-0001	A programmatic EIS for the Bight area leases presents an opportunity to improve the federal permitting process for Bight projects by establishing a baseline environmental analysis that can be relied upon to expedite project-specific environmental analyses. Unfortunately for the reasons detailed below as well as the reasons detailed in the comment letter submitted by the American Clean Power Association (ACP) [Footnote 3: Shell is a member of ACP. Shell generally supports the comments filed by ACP on the Bight PEIS and adopts them to the extent they are not inconsistent with the sentiments expressed by Shell in this letter.] the Bight PEIS does not seize this opportunity. Instead the Bight PEIS appears poised to make the federal permitting process more uncertain and burdensome for developers as it purports to facilitate BOEM's adoption of numerous untested infeasible and unnecessary avoidance minimization mitigation and monitoring (AMMM) measures. In this letter Shell outlines a recommended course correction that will help to ensure that the final Bight PEIS provides a sound basis for expeditious project-specific environmental reviews.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.
BOEM-2024-0001-0440-0005	b. Clarity on Data Sources In the draft PEIS BOEM notes many of the AMMM measures were developed using input from scoping letters coordination with Tribes local state and federal agencies and available COPs. [Footnote 19: Bight Draft PEIS at 3.21.] It would be helpful if the final PEIS contains additional clarity or documentation of the data information and agencies that contributed to the development of the AMMM measures. Specifically this would help lessees understand the bases for the recommended AMMMs and	The scoping report is in Appendix O of the PEIS, which includes a section that describes comments received on proposed AMMM measures, as well as who submitted those comments. The PEIS analyzed the potential range of impacts of an RPDE developed with input from the six NY Bight lessees, the states of New York and New Jersey, and the National Renewable Energy Laboratory (refer to response to comment BOEM-2024-0001-0352-0003).

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	what information would be needed to support appropriate deviations from the AMMMs in COP approvals. More generally Shell recommends that the final PEIS provide clarity on the databases data sets and projects that contributed to the PEIS and how that information translated to the analysis. For example did BOEM select the minimum maximum or a range of impacts across the individual projects evaluated did BOEM focus on the project(s) with the greatest impact on each category considered or was there some other method of incorporating the past projects? Clarity on the information underpinning the analysis in the PEIS will help lessees in developing the information necessary to support their COPs.	
BOEM-2024-0001-0440-0007	d. Conservative Assumptions Throughout the draft PEIS BOEM notes that various impact considerations may be overestimated due to conservative assumptions. While such a conservative approach is not inherently problematic the final PEIS should be clear about the extent to which the analysis may have exaggerated the likely impact on the NY Bight region and relatedly the extent to which the proposed AMMMs may be more stringent than necessary and therefore could be relaxed while still mitigating project specific impacts.	The project-specific COP NEPA analysis may incorporate the PEIS analysis by reference and refine the impact level determinations based on the project-specific details outlined in the COP.
BOEM-2024-0001-0446-0010	3) Missing monitoring requirements a. Hydrodynamic Conditions The dPEIS should incorporate monitoring requirements for assessing effects on hydrodynamic conditions in the NY Bight. These data points will inform our collective understanding and shared learning about whether there are impacts of large offshore wind clusters on marine primary production sediment storage of carbon and dissolved oxygen. b. Decommissioning Even though decommissioning is decades away uncertainty concerning decommissioning requirements influences project-design and material selection decisions being made today. The dPEIS can eliminate some of this uncertainty and incentivize greater interest in using marine-life friendly foundation types and incorporating intentional habitat creation into scour protection and foundations early-on. Appendix G mitigation requirements will influence decisions that developers make concerning investments in voluntarily incorporating Nature-Based Design into scour protection as well as foundation selections because different foundation types	BOEM is currently funding two hydrodynamic impact models for the NY Bight and working with the National Academies of Sciences, Engineering, and Medicine to better develop monitoring and modeling needs. The results of these efforts will inform what project-specific physical oceanographic monitoring may be necessary at a project scale. Project-specific details, such as construction materials and methods, will be revisited at the COP-specific NEPA stage when details are known. Lessees are required to remove all human-made structures from the seafloor unless otherwise determined during the lessees decommissioning application review. Lessees can request that facilities remain in place in the decommissioning application submitted to BSEE (30 CFR 285.909), but BOEM approves or does not approve the request (30 CFR 585.434). Further, decommissioning is covered by BSEE under 30 CFR 285.902 which details the decommissioning application review and approval

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	will require different amounts of scour protection. As written Appendix G only addresses decommissioning mitigation at BB-2 COMFIS-6 EJ-1 MUL-1 and MUL-2 OU-4 and all of these mitigation requirements are designed to avoid or minimize impacts upon decommissioning. None are designed to inform material selection and project design in conjunction with BEN-2 COMFIS-2 or COMFIS-4.The Rigs-to-Reef program is a functional example of human-made structures being left in situ to continue providing complex habitat for marine life. Upon decommissioning of oil and gas platforms in the Gulf of Mexico and California developers apply to leave a portion of each structure in place to continue functioning as an artificial reef (Fortune and Paterson 2021). California guidelines even call for enhancement of human-made habitat upon decommissioning (Schroeder and Love 2004)4. Part of the costs saved by not removing the entire structure is put towards management of the artificial reef (Fortune and Paterson 2021). Monitoring studies that have been sponsored by the federal government include addressing habitat value fish recruitment and attraction and impacts to species upon platform removal (BSEE 2021) [Footnote 5: The dPEIS does not focus on floating wind alternatives but there are unique potential impacts associated with alternative mooring solutions and therefore potentially different respective mitigation requirements that should be similarly addressed in future PEIS where floating wind will be the predominant choice of technology (such as west coast and Gulf of Maine).].Additional considerations concerning decommissioning include the network of federally approved artificial reef areas in the vicinity of proposed offshore wind farms and/or the potential to create new reefs by accepting suitable materials that become available upon decommissioning. For example New York State Department of Environmental Conservation has federal permits for 9 artificial reef sites. These 9 sites total more than 10 square miles in the New York Bight including the newly established 16 Fathom Reef which is near the Empire Wind site. The New Jersey Department of Environmental Protection holds permits for 17 artificial reefs encompassing a total of 25 square miles. These sites have the potential to serve as recipients of artificial reef-appropriate materials upon decommissioning. The population-level effects of offshore	process, while 30 CFR 285.910 details removal of facilities. Additionally, 30 CFR 285.909 details the authorization to have facilities remain in place, and, specifically, 30 CFR 285.909.909(c) speaks to facilities that will be toppled in place or converted to artificial reef purposes (https://www.ecfr.gov/current/title-30/chapter-II/subchapter-B/part-285/subpart-I/subject-group-ECFR73f535d05e8b5d9/section-285.909).

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	wind structures in the US Atlantic are not yet understood. Between construction and decommissioning in the New York Bight and beyond an analysis should be performed to better characterize the potential effects of leaving infrastructure in the water. Habitat-limited and recruitment-limited fish species stand to experience the greatest benefit from implementing a "turbines-to-reefs" style program.	
BOEM-2024-0001-0446-0011	By way of providing an example of what could be included in the final PEIS TNC slightly modified Table ES-1 from the above-referenced 2021 white paper to include a column for potential impacts and a column for required mitigation per foundation type. [Footnote 3: This chart was copied from Comparison of Environmental Effects from Different Offshore Wind Turbine Foundations OCS Study BOEM 2021-053. The columns labeled Maximum Water Depths and Preferred Geologic Conditions are intentionally left blank.] The required mitigation corresponds with the proposed mitigation in Appendix G of the dPEIS and is sorted by AMMM measures that are clearly included to address impacts associated with vibratory or impact pile- driving from AMMM measures designed to apply to the protection of marine mammals regardless of foundation type.	Thank you for your comment. The AMMM measures in the PEIS are sorted by resource instead of IPF. BOEM is taking this into consideration for future NEPA documents.
BOEM-2024-0001-0446-0008	a. Link related AMMM measures. The dPEIS provides an opportunity to not only apply mitigation measures across the six adjacent lease areas but to also make the correlation between proposed AMMM measures clearer and therefore make collective monitoring and adaptive management strategies possible and more effective. The dPEIS groups AMMM measures which could potentially be applied across more than two resource areas under the multiple (MUL) category but it does not throughout Appendix G cross-reference AMMM measures that would benefit from alignment with each other. For example BEN-2 Foundation Scour Protection Monitoring does not make any reference to COMFIS-4 but clearly these measures should be cross-referenced. In particular the scour protection monitoring required in BEN-2 should be linked to nature-inclusive design monitoring where facility planning and project design utilizes nature-inclusive designs. Scour protection monitoring should be designed to evaluate the effectiveness of design materials	BOEM has deconflicted BEN-2 and COMFIS-4 in the Final PEIS.

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	to maximize available habitat for fish according to the criteria for study development set out in BOEM's Environmental Studies Program's 2022-23 Studies Development Plan. [Footnote 7: https://www.boem.gov/sites/default/files/documents/environment/environmental- studies/SDP_2022-2023.pdf] COMFIS-2 Scour and Cable Protection allows for the use of natural and engineered stone in areas not heavily trawled and addresses the complexity required for materials and design of scour and cable protection but again this AMMM measure is not cross-referenced with BEN-2 or COMFIS-4. Nature-based design of scour protection and cable mattresses might provide benthic/fishery habitat mitigation and enhancement opportunities necessary mitigation for marine mammals marine life and benthic habitat and inform other COP terms and conditions. The dPEIS also does not require the same minimum monitoring requirements from resource to resource which results in inconsistent monitoring requirements attached to different AMMM measures for different species and resources.	
BOEM-2024-0001-0450-0001	Impact Analysis: BOEM should address the lack of explanation for Impact differences between alternatives revising Impact terminology to better reflect potential reductions in impacts with AMMM measures.	Refer to responses to comments BOEM-2024-0001-0317-0016, BOEM-2024-0001-0352-0003, and BOEM-2024-0001-0331-0012. Impact levels would be refined at the project-specific COP NEPA stage.
BOEM-2024-0001-0452-0004	IV. Analysis of AMMM Measures Each avoidance minimization mitigation and monitoring (AMMM) measure should have been analyzed separately as individually defined alternatives or sub-alternatives as well as cumulatively. As presented in the draft PEIS the binary option to adopt all or no measures makes it impossible to understand how beneficial any proposed measure will be to offset the impacts of development. Analysis of the impact of each measure on mitigation particularly if individual projects propose using only a subset of the measures in a COP would allow the public to better understand how resources would be best directed to inform a specific project and to inform public comment. AMMM measures should be evaluated as NEPA alternatives in downstream project-specific analyses in the event any measures are not proposed as a mitigation measure in a developer's project-specific COP. In the Proposed Action unmitigated impacts should be highlighted so the public can also compare analysis conducted in the PEIS and future	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012.

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	EISs where project specific measures can be included. BOEM should seize and expand upon this opportunity to increase transparency and the inclusion of impacted parties which has been insufficient in many actions to date.	
BOEM-2024-0001-0469-0022	VII. Monitoring & Enforcement Though BOEM lists the agencies that will be responsible for enforcing some of the AMMM measures the agency does not list the authorities that allow them to do so[Footnote 77: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 appx. G.] or indicate any standards for enforcement or monitoring compliance with AMMM measures. Further although BOEM staff repeatedly stated that research will be ongoing and AMMM measures will be refined as OSW develops there are no standards for evaluating the AMMM measures or for determining how to proceed if a project causes more severe environmental impacts than anticipated; for example when and how to adapt mitigation measures or stop work altogether. Frequent monitoring would be required to know when severe environmental impacts occurred. OSW developers are required to submit monitoring reports periodically; these reports should be made publicly available. BOEM should create standards for evaluating the efficacy of AMMM measures and make all monitoring plans and reports accessible to the public. Public transparency is essential and systems to ensure public access at many levels of OSW development are severely lacking; for example there is no way for the public to monitor when where and under what permit surveying and/or construction activities are taking place.	Refer to responses to comments BOEM-2024-0001-0317-0016 and BOEM-2024-0001-0331-0012. Adaptive management will be considered on a case-by-case basis.

Table P.5.23-2. Responses to Substantive Comments on Mitigation and Monitoring—Marine Minerals

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BOEM-2024-0001-0439-0087	Measure ID:OU-4Measure Name: Decommissioning in marine minerals resource areas. Description: Infrastructure emplaced in marine minerals resource areas must be removed from the marine mineral resource area during decommissioning. In addition any request to decommission in place in such areas through a departure request must demonstrate no significant impacts to marine minerals resources. Previously Applied as a COP T&C: Category: D ACP Comment: Removal of facilities is already covered by BSEE's regulations at 30 CFR 285.910 (a) which states that " You must remove all facilities to a depth of 15 feet below the mudline unless otherwise authorized by BSEE". Significant impacts to marine minerals resources have not been demonstrated to occur from offshore wind development therefore it is inappropriate to require developers to demonstrate that no significant impacts will occur when these impacts have not been demonstrated by BOEM's environmental analysis. In addition there is already a regulatory process for requesting decommissioning in place which requires that it be captured in the decommissioning plan for which BOEM reviews and conducts a separate environmental review (including NEPA analysis) and consultations. This review would further analyze and determine any significant impacts from decommissioning (as outlined in the project specific decommissioning plan) that may require mitigation. It would be appropriate for project specific decommissioning conditions to be analyzed and applied during that review and not 30 plus years before any decommissioning plan is submitted.	While 30 CFR 285.910 states that facilities to a depth of 15 feet below the mud line must be removed, there is a caveat that states “unless otherwise authorized by BSEE.” The procedure for requesting this exception is further explained in 30 CFR 285.909(a), which states, “In your decommissioning application, you may request that certain facilities authorized in your lease or grant remain in place for other activities authorized in this part, elsewhere in this subchapter, or by other applicable Federal law.” The intent of this AMMM measure is to specify that this request to decommission infrastructure in place may not be made if the infrastructure occurs within a marine minerals resource area. The NEPA analysis and impact conclusion for marine minerals is dependent on the eventual decommissioning of any infrastructure within a marine minerals resource area. The area may be affected now but the consideration that the area will be available for future use (in 30+ years) following decommissioning leads to a decreased significance level in our NEPA analysis. In some areas, where resources are limited (such as the New Jersey coast), the “reservation” of sand within the cable corridor may be an important consideration in BOEM’s impacts analysis.
BOEM-2024-0001-0446-0010	3) Missing monitoring requirements a. Hydrodynamic Conditions. The dPEIS should incorporate monitoring requirements for assessing effects on hydrodynamic conditions in the NY Bight. These data points will inform our collective understanding and shared learning about whether there are impacts of large offshore wind clusters on marine primary production sediment storage of carbon and dissolved oxygen. b. Decommissioning. Even though decommissioning is decades away uncertainty concerning decommissioning requirements influences	Lessees are required to remove all human-made structures from the seafloor unless otherwise determined during the lessees decommissioning application review. Lessees can request that facilities remain in place in the decommissioning application submitted to BSEE, but BOEM approves or does not approve the request (30 CFR 585.434). BSEE federal regulations (30 CFR 285.900-285.913) detail decommissioning obligations and requirements, decommissioning applications, and facility

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	project-design and material selection decisions being made today. The dPEIS can eliminate some of this uncertainty and incentivize greater interest in using marine-life friendly foundation types and incorporating intentional habitat creation into scour protection and foundations early-on. Appendix G mitigation requirements will influence decisions that developers make concerning investments in voluntarily incorporating Nature-Based Design into scour protection as well as foundation selections because different foundation types will require different amounts of scour protection. As written Appendix G only addresses decommissioning mitigation at BB-2 COMFIS-6 EJ-1 MUL-1 and MUL-2 OU-4 and all of these mitigation requirements are designed to avoid or minimize impacts upon decommissioning. None are designed to inform material selection and project design in conjunction with BEN-2 COMFIS-2 or COMFIS-4.The Rigs-to-Reef program is a functional example of human-made structures being left in situ to continue providing complex habitat for marine life. Upon decommissioning of oil and gas platforms in the Gulf of Mexico and California developers apply to leave a portion of each structure in place to continue functioning as an artificial reef (Fortune and Paterson 2021). California guidelines even call for enhancement of human-made habitat upon decommissioning (Schroeder and Love 2004)4. Part of the costs saved by not removing the entire structure is put towards management of the artificial reef (Fortune and Paterson 2021). Monitoring studies that have been sponsored by the federal government include addressing habitat value fish recruitment and attraction and impacts to species upon platform removal (BSEE 2021) [Footnote 5: The dPEIS does not focus on floating wind alternatives but there are unique potential impacts associated with alternative mooring solutions and therefore potentially different respective mitigation requirements that should be similarly addressed in future PEIS where floating wind will be the predominant choice of technology (such as west coast and Gulf of Maine).].Additional considerations concerning decommissioning include the network of federally approved artificial reef areas in the vicinity of proposed offshore wind farms and/or the potential to create new reefs by accepting suitable materials that become available upon decommissioning. For example New York State	removal. Specifically, 30 CFR 285.909 details the authorization to have facilities remain in place, and 30 CFR 285.909 (c) speaks to facilities that will be toppled in place or converted to artificial reef purposes. BSEE federal regulations related to decommissioning renewable energy facilities can be found at: https://www.ecfr.gov/current/title-30/chapter-II/subchapter-B/part-285/subpart-I. Project-specific details, such as construction materials and methods, will be revisited at the COP-specific NEPA stage when details are known. Regarding hydrodynamic conditions and monitoring requirements, BOEM may require additional or different measures based on future, site-specific NEPA analysis or the parameters of specific COPs (when more project-specific details are known). BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.

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	Department of Environmental Conservation has federal permits for 9 artificial reef sites. These 9 sites total more than 10 square miles in the New York Bight including the newly established 16 Fathom Reef which is near the Empire Wind site. The New Jersey Department of Environmental Protection holds permits for 17 artificial reefs encompassing a total of 25 square miles. These sites have the potential to serve as recipients of artificial reef-appropriate materials upon decommissioning. The population-level effects of offshore wind structures in the US Atlantic are not yet understood. Between construction and decommissioning in the New York Bight and beyond an analysis should be performed to better characterize the potential effects of leaving infrastructure in the water. Habitat-limited and recruitment-limited fish species stand to experience the greatest benefit from implementing a "turbines-to-reefs" style program.	
BOEM-2024-0001-0439-0089	Measure ID:OU-6 Measure Name: Marine minerals resource area avoidance Description: Lessees must coordinate with the BOEM Marine Minerals Program (MMP) USACE and state resource agencies (e.g. NJDEP NYSDEC NYSDOS) on cable corridor placement with any preliminary design or design changes and prior to final cable placement. Lessees must ensure that bottom-disturbing activities avoid to the maximum extent practicable nearshore borrow areas and OCS sediment resources. Any activity that lasts more than 180 days and is located within 500 lateral meters of any marine minerals resource areas or limits the long-term use of the resource is considered bottom disturbing. Lessees must use their geophysical and geological information collected in/along proposed corridors to demonstrate and verify the existence of sand resource or dearth of sand resource and estimate (via range) the possible implication of cable crossing on volume access. The Lessee is responsible for responding to any request from these agencies in writing and to show good faith efforts to avoid sand resources to the maximum extent practicable or explain why another alternative is not technically or economically feasible. Previously Applied as a COP T&C: Category: G T/EACP Comment: This measure should refer to the avoidance of active designated USACE sand resources and not more generally to "nearshore borrow areas" "OCS sediment	OU-6 was divided into OU-6 and OU-8. OU-8 is an RP to ensure bottom-disturbing activities avoid nearshore borrow areas to the maximum extent practicable. The commenter's statement, "This measure should refer to the avoidance of active designated USACE sand resources and not more generally to 'nearshore borrow areas' 'OCS sediment resources' and 'any marine minerals resource areas," is incorrect. More than active USACE sand resources are considered in the impact analysis and all the listed resources should be considered in any future tiered NEPA analyses. The commenter's statement, "It is not technically or economically viable for the lessee to 'demonstrate and verify the existence of sand resource or dearth of sand resource and estimate (via range) the possible implication of cable crossing on volume access,'" is not accurate. Many lessees have demonstrated and verified sand resources in collaboration with BOEM and USACE and collect ample G&G data needed to generate volume estimates of potential sand resource areas in the proposed export cable corridors. The commenter states, "This measure is a project design measure that would be assessed during COP development the subsequent

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	resources" and "any marine minerals resource areas." It is not technically or economically viable for the lessee to "demonstrate and verify the existence of sand resource or dearth of sand resource and estimate (via range) the possible implication of cable crossing on volume access". This measure is a project design measure that would be assessed during COP development the subsequent individual project NEPA process and the USACE Section 408 process. The PEIS intends to analyze measures that can be approved as terms and conditions of plan approval for individual project specific COPs. Since this measure dictates how a COP should be developed by its very nature it could not be implemented through terms and conditions of COP approval and therefore is not appropriate to be included as an AMMM.	individual project NEPA process and the USACE Section 408 process. The PEIS intends to analyze measures that can be approved as terms and conditions of plan approval for individual project specific COPs. Since this measure dictates how a COP should be developed by its very nature it could not be implemented through terms and conditions of COP approval and therefore is not appropriate to be included as an AMMM." This AMMM measure considers submission of data for post-lease monitoring and any potential changes to the export cable placement and is not exclusive to pre-COP submissions.
BOEM-2024-0001-0439-0094	Measure ID:STF-5 Measure Name: Trailing suction hopper dredge mitigation Description: If a trailing suction hopper dredge is used offshore operators must disengage dredge pumps when the dragheads are not actively dredging and therefore working to keep the draghead firmly on the bottom in order to prevent impingement or entrainment of ESA-listed fish and sea turtle species. Pumps must be disengaged when lowering dragheads to the bottom to start dredging turning or lifting dragheads off the bottom at the completion of dredging. Previously Applied as a COP T&C: Category: ACP Comment: The definition of "firmly" requires clarification. Drag arms have jets that mobilize the soil which is then pumped into the dredge hopper. The drag arm is never fully resting on the bottom because of this.	STF-5 has been revised to include, "A state-of-the-art-faced deflector that is attached to the draghead must be used on all hopper dredges at all times." This specification is important because the intent of keeping dragheads "firmly" on the bottom is to ensure that the turtle-deflecting draghead is effectively "plowing" to push a sand wave and reduce risk. The *firmly* term comes directly from the South Atlantic Regional Biological Opinion mitigation measures.

Table P.5.23-3. Responses to Substantive Comments on Mitigation and Monitoring—Acoustics

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BOEM-2024-0001-0406-0022	v. Measures that Undermine Certainty of COP Approval Through Additional Plan Requirements BOEM's recent COP approvals already impose requirements for reporting monitoring and post-approval plan submittals far beyond what BOEM and other federal agencies require for other types of energy infrastructure projects. The proposed AMMM measures in the Draft PEIS increase even further the number of post-ROD plan submittals that would be required collectively eroding the certainty that a COP approval and ROD should provide and compromising developers' ability to adhere to a planned construction schedule which can have significant adverse commercial and economic consequences for a project. By way of example we highlight the following post-COP approval requirements for additional plans and approvals: COMFIS-3 which would impose a new Scallop Monitoring Plan to be coordinated with NMFS; [Footnote 10: This measure also appears to be redundant of and potentially out of date with existing shellfish monitoring requirements.] MM-5 which would add a new North Atlantic Right Whale Strike Management Plan; MMST-1 which would codify the submittal to NOAA BSEE and BOEM of an Alternative Monitoring Plan for low-visibility and nighttime pile-driving; MMST-2 which would require the submittal of a separate Pile-Driving Monitoring Plan; MUL-2 which would require the submittal of an anchoring plan detailing where anchoring will be used during construction operations and decommissioning; MUL-3 which would require a Berm Remediation Plan to restore berms created during cable laying activities; and MUL-24 which (as noted above) would require the submittal of an adaptive management plan with legally deficient components; and MUL-29 which would require submitting a separate Sound Field Verification Plan before commencing pile driving activities. These additional plans are not only costly and time-consuming to prepare and implement but they defer critical approvals that have material impacts on construction timelines and delay pivotal procurement decisions. The requirement for multiple plans rather than fewer comprehensive ones also increases the potential for introduction of conflicting measures and creates a	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. Measures that have been required in previous COP approvals include MM-5, MMST-1, MMST-2, MUL-2, MUL-3, MUL-29, and COMFIS-3. Therefore, these are measures that the offshore wind industry is familiar with for projects on the Atlantic OCS. MUL-24 was deleted. Additionally, lessees have the option to submit their plans separately or all in one document.

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	significant challenge for tracking compliance. Further BOEM should be mindful of the impact on its own workload and resources and those of the consulting agencies that the sheer volume of required plans would present. Before the final NYB PEIS and in advance of any project-specific approvals BOEM should conduct a comprehensive review of the cumulative effects of these plan requirements on project timelines and economics eliminate the ones that are not necessary and commit to fold the remaining ones into the COP approval and ROD wherever feasible.	
BOEM-2024-0001-0352-0008-a	MUL-3: Berm survey and report We generally support this AMMM measure; however as written it provides lessees too much flexibility and it essentially requires just a plan without associated action.	Thank you for your comment. MUL-3 requires lessees to develop and implement a Berm Remediation Plan to restore created berms to match adjacent natural bathymetric contours (isobaths), as technically and economically practical or feasible.
BOEM-2024-0001-0439-0018	V. BOEM should remove certain AMMMs from consideration. Even assuming BOEM reframes the PEIS and acknowledges that the agency is considering AMMM measures that it [italicized: may] require as conditions of approval it should remove from consideration certain inappropriate AMMMs. Attachment A provides the OSW industry's detailed comments on specific AMMMs. As demonstrated by those comments many of the AMMMs proposed by BOEM are inappropriate because to varying degrees they are outside of BOEM"s statutory authority and are duplicative are more suitably proposed as COP guidance will be technically or economically infeasible will create untenable safety issues or undue burden on industry and/or are voluntary a. BOEM should remove AMMMs that are outside their statutory authority and duplicative. An agency "may not exercise its authority in a manner that is inconsistent with the administrative structure that Congress enacted into law."[Footnote 38: Food and Drug Admin. v. Brown & Williamson Tobacco Corp. 529 U.S. 120 125 120 S.Ct. 1291 146 L.Ed.2d 121 (2000) (quoting ETSI Pipeline Project v. Missouri 484 U.S. 495 517 108 S.Ct. 805 98 L.Ed.2d 898 (1988)).] As such BOEM cannot implement AMMMs that are outside of its authority. While a NEPA analysis can review mitigation measures that are not within an agency's authority the agency cannot impose these measures on the lessee or adopt them in a ROD but can only cross-reference those measures to provide for interagency	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. BOEM’s review and revision of AMMM measures has resulted in EJ-1 from the Draft PEIS being split into a not previously applied AMMM measure (EJ-1a) and an RP (EJ-1b); these AMMM measures have been revised to further reduce potential duplication with existing state and local requirements and describe how lessees may refer to other requirements to satisfy the AMMM measure. AQ-1 through AQ-5 and MUL-7 have become RPs and MMST-13 was incorporated into MMST-14.

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	coordination. In fact "Agencies should not commit to mitigation however unless they have sufficient legal authorities and expect there will be necessary resources available to perform or ensure the performance of the mitigation."[Footnote 39: Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact 76 FR 3843 (Jan. 2011)] Indeed BOEM itself notes that not all "AMMM measures are within BOEM's statutory and regulatory authority; those that are not may still be adopted and imposed by other governmental agencies."[Footnote 40: DPEIS Appendix G.] As such BOEM should not develop duplicative or additive AMMM[Footnote 41: As discussed below the AMMM implies it is within BOEM's authority to issue. Instead BOEM should simply analyze the environmental effects of air permits that would be required by EPA.] or impose any requirements for measures that fall outside of their statutory authority. Instead BOEM should defer to cooperating agencies with regulatory authority to impose certain mitigation measures.[Footnote 42: See Wyoming v. U.S. Dep't of the Interior 493 F. Supp. 3d 1046 (D. Wyo. 2020) (BLM rule referencing EPA regulations "usurps the authority to regulate air emissions Congress expressly delegated to the EPA").] For example AQ-1 through AQ-5 would impose air quality requirements; however emissions in the NY Bight lease area are regulated by the Environmental Protection Agency ("EPA") under its Clean Air Act regulations at 40 C.F.R. Part 55. AQ-1through AQ-5 are duplicative of EPA's air permit process and create the potential for conflicting requirements and confusion. Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. For example with respect to AMMM AQ-4 as part of the BACT/LAER analysis applicants will assess the feasibility of add-on pollution controls (e.g. Selective Catalytic Reduction Selective non-Catalytic Reduction NOx Adsorber/Scrubber Lean NOx Catalysts	

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	SOx Scrubber Diesel Particulate Filter Diesel Oxidation Catalyst etc.) on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why these add-on pollution controls are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. BOEM should not use its AMMMs to reinforce existing standards or legal requirements over which it has no authority itself. Similarly MMST-13 attempts to characterize existing vessel speed rules but may ultimately create conflict if those regulations are modified. EJ-1 would require lessees to develop an Environmental Justice Communications Plan but an Environmental Justice Plan is already required by both the states of New York and New Jersey. AMMMs that are duplicative of (and potentially in conflict with) existing state or Federal requirements should be removed from BOEM's proposed AMMMs. Finally with AMMM MUL-7 BOEM attempts to meet International Maritime Organization ("IMO") standards. These standards are outside of BOEM's jurisdiction and authority and BOEM may not use AMMMs developed through NEPA to enforce compliance with those standards (see Attachment A for additional examples).	
BOEM-2024-0001-0446-0004	Including a breakdown of required mitigation associated with different foundation types will allow developers to frontload their respective project analyses and prioritize the least impactful and most cost-effective project designs and realistic construction schedules at an earlier point. But including this breakdown of respective mitigation requirements means that BOEM also must evaluate potential impacts associated with testing quiet foundations as part of the initial environmental assessment of site assessment and site characterization activities authorized in site assessment plans (SAP). [Footnote 6: TNC submitted comments on this issue in its December 7 2023 comment letter on BOEM's Notice of Intent To Prepare an Environmental Assessment for Additional Site Assessment Activities on Beacon Wind LLC's Renewable Energy Lease OCS-A 0520 [Docket No. BOEM-2023-062] and in its February 12 2024 comment letter on the Draft Environmental Assessment for Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Delaware Maryland	Thank you for the recommendation; however, BOEM has determined that it is out of scope for this PEIS. BOEM will take this recommendation into consideration for the future.

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	and Virginia (Central Atlantic) [Docket No. BOEM2024 0004].] If the SAPs do not allow for the testing of quiet foundations during the site assessment phase for projects developers will not be able to do the necessary testing and analyses to inform their technology and design decisions and their COPs.	
BOEM-2024-0001-0357-0057	Enclosure VII Vessel surveys Cumulative Impact. This map shows the survey area for just one vessel survey effort for the Atlantic Shores South project. The purpose of this survey is stated at the top of the map to characterize the lease area in purple go and its export cable routes whose landfalls are shown by an X. But the whole area purple green and pink goes far beyond that all the way up the New Jersey coast and out to Long Island. Similar area extensions exist for the other lease areas in the New York Bight. The survey areas also overlap each other. The end result is a huge area surveyed in many places repeatedly by different companies. This results in a very large total number of noise disturbances to the animals and likely repeated disturbances to the same animal. It is not clear why such large survey areas are being approved unless they are actually looking for new turbine locations. If so then one AMMM measure should be to cut back on the vessel survey area. Marine mammal exposes should be limited only to those essential for the current projects. Furthermore the selection of any future turbine locations should not be prejudiced by these surveys but should be done through an open process with the appropriate environmental reviews. SEE ORIGINAL COMMENT FOR MAP: Atlantic Shores Survey Area States Purpose Site Characterization for turbines substations cables "within the lease area and along export cable routes."	Thank you for your comment. At this programmatic review stage, without knowing survey areas for specific projects, it is not practical to place limitations. Project details would be revisited during the project-specific COP NEPA review.
BOEM-2024-0001-0357-0060	Enclosure IX Exaggerated Effects of AMMM measures and Missing Measures. It is extremely difficult to follow the BOEM program EIS and find what the AMMM measures are with respect to marine mammal protection. However having brought the subject up the BOEM and the NMFS should address their over reliance on visual spotters. Visual Spotters: As discussed in the cover letter the monitoring zones being presented by the BOEM and Marine Fisheries are too small to mitigate both level A and level B takes. Given these larger monitoring zones the emphasis on visual observation is entirely misplaced. The limitations on visual detection	BOEM appreciates your comment. Appendix G provides a table containing all AMMM measures and a column within this table indicates which resource area(s) are mitigated by each measure. Both visual and acoustic monitoring have advantages and disadvantages under various conditions; using a suite of tools including visual and acoustic monitoring is necessary in the AMMM measures. BOEM is using the best available science to determine appropriate AMMM measures, but is conducting ongoing

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	of marine mammals have been well documented e.g. see the World Wildlife Federation Report Titled Reducing Impacts of Noise from Human Activities on Cetaceans 2014 Section 5. Visual monitoring would seem especially unreliable for vessel survey activities that continue year-round and at night and now that the need for monitoring zones much greater that 500 meters has been identified. A two-year comparison of visual and acoustic detection in the study titled A Comparison of Visual and Acoustic Autonomous Monitoring Methods for Investigating Temporal Variation in Occurrence of Southern Right Whales dated November 2017 showed that a PAM system was six times more effective in identifying whale presence than visual methods. A study done by Kimura et al. Kimura S T Akamatsu K Wang D Wang S Li S Dong and N Arai. 2009. "Comparison of stationary acoustic monitoring and visual observation of finless porpoises." The Journal of the Acoustical Society of America 125(1):547553 compared visual and acoustic monitoring of the Yangtze finless porpoise. Acoustically the porpoise was detected approximately 82% of the observation times versus visual detection of about 13% of the observation times as shown in the results below. The PAM underestimated group size due to limited resolution of bearing angles yet was more accurate than visual especially with low-density populations which is particularly relevant to detecting right whales. SEE ORIGINAL COMMENT FOR GRAPH: Average number or porpoises detected	conversations with agencies and the regulatory and scientific communities on what other methods can be used.
BOEM-2024-0001-0357-0062	Pile Driving-Unjustified Noise Source Attenuation Assumptions The BOEM program AMMM EIS is extremely difficult to follow and it is unclear what the AMMM measures actually being proposed are. But having brought the issue up regarding pile driving the BOEM and NMFS should address their use of a 10 dB noise source noise attenuation in their project conclusions which as shown below is not justified. There appears to be no basis for assuming any significant noise source attenuation in the hearing frequency ranges of the right whale and other low frequency cetaceans (LFC's). Therefore absent any evidence to the contrary the NMFS should cease using this assumption in its MMPA rulemaking and revise its biological opinion for the project. Similarly the BOEM should cease using it in its EIS.	Using quieting technology (e.g., noise attenuation systems [NAS]) reduces the risk of noise impacts on marine mammals by reducing the sound levels that propagate from the pile source. Available studies suggest that when a single or combined NAS is applied to monopile installation, noise reductions ranging from 3 to 17 dB can be achieved depending on the NAS combination, with some frequency-dependent reductions of more than 20 dB (Bellmann et al. 2020).

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BOEM-2024-0001-0439-0050	Measure ID: MM-2 Measure Name: Real-time PAM monitoring and alert system for baleen whales Description: Implementation of a near real-time passive acoustic monitoring (PAM) system for the detection of baleen whales in the NY Bight during offshore wind development activities will be required with an alert system/notice to mariners/construction operators. This could be achieved through the deployment of several ocean gliders or fixed PAM systems in the broader NY Bight area. The equipment could be deployed anywhere there is offshore wind development activities including on the leases but may be particularly useful between leases where the placement of other real-time PAM systems is not already directed or near transit or cable-laying corridors or other locations where real-time alerting of marine mammal presence would be beneficial to the offshore wind-related activities occurring in one or more lease areas. Every effort should be made to deploy equipment in advance of any on-water activity including site characterization work construction work etc. for use in mitigating against potential vessel strike risk. Each system will be equipped with reliable PAM technology and marine mammal detection and classification software. Detections will be transmittable to a PAM analyst for verification. The systems will be capable of alerting offshore wind developers that a baleen whale has been detected in the general area of offshore wind development-related activity through methods such as Whale Alert or an offshore wind-specific notification system. This could also be achieved through partnership with other industries academia NGOs and federal agencies in a regional effort. This real-time PAM alert system will increase the opportunity to detect marine mammals in the greater NY Bight area providing the opportunity for increased situational awareness (for vessel strike avoidance) to PSOs and others of marine mammal presence in the area. The submission of raw data or data products associated with real-time PAM will be required. The real-time PAM data will be saved and stored for archiving as soon as practicable after instrument recovery through the National Centers for Environmental Information or a similar entity determined by BOEM. The archived data will be integrated into community PAM efforts in the broader region such as through the Regional Wildlife Science Collaborative to understand marine	Thank you for your comment; BOEM will take it into consideration. MM-2 is an RP in the Final PEIS and lessees are encouraged to analyze and consider implementing these RPs, as they may further reduce potential impacts.

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	mammal distribution/occurrence in the area which can then be used to inform future predictions of potential impacts to marine mammals. Category: BACP Comment: This measure is born out of voluntary commitments made by offshore wind developers to advance detection technology and improve situational awareness of NARWs. The intent of advancing this technology was to seek relief from speed constraints that exceeded the vessel speed rule. Industry supports this measure if it allows relief from speed constraints that exceed the vessel speed rule and BOEM should specify how this measure would provide relief from vessel speed constraints. However as written this measure creates an undue burden on lessees and similar requirements do not exist for any other marine industry. BOEM should remove this measure and all other vessel speed related measures and reference the vessel speed rule solely or at minimum all measures should be phrased such that the measures do not conflict with or exceed the revised speed rule. If BOEM decides to require measures that exceed the vessel speed rule there must be justification as to how the mitigation measures reduce the risk to whales considering the NY Bight lease activities (and offshore wind related vessel traffic in general) make up a very small percentage of the total vessel traffic in the region. In addition BOEM should consider how implementation of these measures would increase risk to whales as more vessels would be required to deploy and maintain equipment. Alternatively BOEM could tie this measure specifically to any speed constraints they chose to adopt that exceeds the vessel speed rule as an alternative option in lieu of speed constraints. BOEM should very clearly link all vessel speed and situational awareness measures to the vessel speed rule and planned updates to it. See also response to MM-3 below.	
BOEM-2024-0001-0450-0058	Measure ID and Name: MM-2: Real-time PAM monitoring and alert system for baleen whales Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "Each system will be equipped with reliable PAM technology and marine mammal detection and classification software....This could also be achieved through partnership with other industries academia NGOs and federal agencies in a regional effort. [Underline: Each PAM system will be set up so that it is	Thank you for the suggestions. The RP language was updated for MM-2; however, additional or different measures can be considered at the project stage and include more detail.

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	capable of localizing vocalizing whales. A plan detailing any proposed localization system and analysis methods should be submitted to BOEM and other relevant permitting agencies in advance of deployment. The system should meet the following criteria: 1.Stationary systems must have a minimum of three hydrophones (accuracy can be greatly improved by using four hydrophones) and mobile systems (e.g. towed arrays) must have a minimum of two hydrophones. 2. Simulations should be conducted prior to selecting the number and location of receivers to maximize accuracy (i.e. reduce confidence intervals) in the final configuration. 3. Systems should be calibrated before deployment to ensure accurate detection capability. 4. For time-of-arrival based systems synchronization of data streams from the multiple receivers is necessary for accurate calculations. 5. Irrespective of the system used careful testing and documentation of localization errors should be undertaken.] This real-time PAM alert system will increase the opportunity to detect marine mammals in the greater NY Bight area..." Notes: We support measure MM-2 which requires that a near real-time passive acoustic monitoring (PAM) system be required for the detection of baleen whales during development activities. We recommend that BOEM require PAM systems to be set up so that they can localize whale vocalizations. Localization capability will assist project proponents in determining whether baleen whales are within the relevant clearance or exclusion zone during offshore wind activities. We recommend that BOEM include five criteria for PAM systems. If localization is not feasible BOEM should require that development activities with the potential to harm North Atlantic right whales are not commenced or shut down if already started upon detection of a vocalization of a North Atlantic right whale at any distance from the acoustic recorder.	
BOEM-2024-0001-0357-0061	A study titled Pam Guard Quality Assurance Module for Marine Mammal Detection using Passive Acoustic Monitoring (PAM) dated August 2020 found that (its Figure 10) the mean probability of right whale detection with a PAM system varied from 0.9 to 0.5 at 500 meters for low and high background noise conditions respectively. At	Thank you for your comment. BOEM carefully reviews PAM plans for each project.

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	1500 meters those probabilities drop to from 0.5 to 0.03 and are subject to wide statistical variation. Since visual detection is 6 times less effective it is clear that the probability of detection at larger distances is very low regardless of how many spotters you put on deck. Therefore for these larger pile driving monitoring zones a very robust PAM system consisting of a many monitors would be needed to have even a modest chance of detection. For vessel surveys a number of additional vessels removed from the geophysical survey source vessel to avoid masking would be needed and/or a large number of mono-buoys that can operate in near real time placed strategically. Without such robust PAM systems the AMMM measures offered will not be effective in detecting low frequency marine mammals in the area. Therefore [Bold: such robust PAM systems should have been outlined in the program EIS.]	
BOEM-2024-0001-0406-0019	iii. Measures That Are Disproportionate to Anticipated Impacts Certain AMMM measures would create post-approval regulatory burdens that are out of proportion to the impacts estimated by BOEM in the Draft PEIS. CEQ regulations direct that "[e]nvironmental impact statements shall discuss impacts in proportion to their significance." 40 CFR 1502.2(b). Similarly CEQ's 2011 mitigation guidance cautions that "[i]n cases that are less important the agency should exercise its discretion to determine what level of monitoring if any is appropriate." Id. In determining the importance of a measure CEQ urges agencies to consider inter alia the presence of "legal requirements of statutes regulations or permits"; "[h]uman health and safety"; and [l]evel of intensity of projected impacts." Id. Examples of AMMM measures that would impose disproportionately high burdens on the NYB projects include: MM2 and MM3 requiring the implementation of real-time and long-term passive acoustic monitoring. While these measures may be technically possible the extraordinary cost of implementation is not commensurate with the anticipated negligible increase in species protection.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. BOEM's review and revision of AMMM measures has resulted in MM-2 becoming an RP. MM-3 has been revised with additional details about long-term PAM monitoring. BOEM considers MM-3 to be necessary and warranted, providing information about spatio-temporal changes in animal presence. Developers have an option to pay into a fund that takes care of all of the logistics and reduces the burden on industry.
BOEM-2024-0001-0423-0020	Marine Mammals [bold: MM-2 and MM-3] would require deployment of a real-time or near real-time passive acoustic monitoring (PAM) system for the detection of baleen whales for construction and at least 10 years of operation respectively. MM-2 states that each PAM system would be equipped with [italicized:	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs,

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	"marine mammal detection and classification software."] Based on current industry best practices classification software for whale calls still requires [bold: manual] QA/QC to determine actual species classification and distinguishing marine mammal calls from ocean noise the hydrophone has picked up and flagged. This manual classification would be a significant additional staffing cost to running these systems for 10 years without sufficient justification for that long duration. While PAM systems will be an appropriate element in marine mammal monitoring and mitigation the different nature of each project site and the evolving nature of such technologies mean that a prescriptive approach that imposes such requirements on a "one size fits all" basis needs to be thoroughly considered before implementation. As a reminder no mortality or serious injury to a marine mammal has resulted from the offshore wind industry in the U.S. to date. Rather the vast majority of marine mammal injuries or fatalities that have been evaluated have been tied to non-wind vessel strikes or entanglement with fishing gear. Ocean Winds notes that neither the commercial fishing nor the commercial shipping industries are subject to the anywhere near the level of restrictions that are imposed on offshore wind in spite of their documented impacts to marine mammals. Given that offshore wind vessel traffic even during the construction of an offshore wind farm would represent a small fraction of the vessel traffic in the NY Bight basic principles of fairness would dictate that the cost of an expansive PAM system if implemented should be borne by the entire maritime industry including industries like commercial shipping and fishing given their documented impact to marine mammals.	and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. BOEM's review and revision of AMMM measures has resulted in MM-2 becoming an RP. MM-3 has been revised with additional details about long-term PAM monitoring. Thank you for your comment; BOEM will take it into consideration. A regional PAM network is being developed and will include PAM contributions from industry, researchers, and state and federal stakeholders. At least 3 but not more than 10 years of monitoring is justified based, in part, on the life history of the whales being monitored and of concern.
BOEM-2024-0001-0436-0011	a. Increased Regulatory Burden and Associated Costs The new AMMMs presented in the Draft PEIS will substantially increase the regulatory burden and associated costs to individual projects particularly those measures that call for additional plans reporting requirements data collection and compensatory mitigation. For example MM-2 (Real-time PAM monitoring and alert system) requires lessees to conduct real-time PAM for the detection of baleen whales in the New York Bight during offshore wind development activities with an alert system/notice to mariners/construction operators. This measure is in addition to and	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not

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	not in lieu of vessel speed constraints which have served as acceptable mitigation in previous COPs. BOEM should consider the regulatory burden and cumulative cost of AMMMs to ensure the overall cost-effectiveness of its preferred alternative. AMMMs that are unduly expensive in terms of investment time required for analysis or significantly depreciate project performance will raise power offtake costs thereby affecting ratepayers. BOEM should balance the identified environmental gains of new AMMMs with the potential risk that increased regulatory burden and associated costs create particularly given the tremendous climate benefits that development of offshore wind is intended to provide.	previously applied as T&Cs. BOEM’s review and revision of AMMM measures has resulted in MM-2 becoming an RP.
BOEM-2024-0001-0422-0016	MM-3 Long-term PAM Monitoring Comment #14 on MM-3 By proposing MM-3 the agencies (BOEM the Bureau of Safety and Environmental Enforcement ("BSEE") and the National Marine Fisheries Service ("NMFS")) would commit themselves and the developer community to an expansive and long-term PAM program for which the ultimate efficacy remains unknown. A requirement to deploy this PAM network 1 year before construction has the potential to cause disruptive delays to projects as COPs may be approved less than 1 year before construction activities commence. This measure increases what had been a requirement of 3 years of operational monitoring to at least 10 years. BOEM should demonstrate why 7 years of additional monitoring is needed and what impact this would mitigate. A long-term archival PAM network for at least 10 years would be costly and it is unclear to what extent it would enhance environmental protections. It is also unclear how this measure and the optionality to pay into BOEM's Environmental Studies Fund would either compliment or conflict with BOEM's proposed POWERON network participation by developers.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MM-3 has been revised with additional details about long-term PAM monitoring. Thank you for your comment; BOEM will take it into consideration. If this AMMM measure is made a T&C at the COP-approval level, developers can anticipate the 1-year pre-construction requirement well in advance of construction. A regional PAM network is being developed and will include PAM contributions from industry, researchers, and state and federal stakeholders. At least 3 but not more than 10 years of monitoring is justified based, in part, on the life history of the whales being monitored and of concern.
BOEM-2024-0001-0439-0051	Measure ID: MM-3 Measure Name: Long-term PAM monitoring Description: The Lessee must conduct archival continuous and long-term PAM to develop baselines and monitor changes in the presence of marine species as well as changes in ambient noise for 1 year before construction through at least 10 years of operations. The	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs,

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	exact number of instruments per lease area will vary but will be configured to identify and localize the calls of vocalizing NARWs within the lease area. Throughout deployments and data analysis the Lessee will be expected to follow the best practices outlined in the Regional Wildlife Science Collaborative (RWSC) Best Practices. The Lessee must also process the data to document at the very least the locations of baleen whale vocalizations (with confidence intervals) and metrics of ambient noise. The Lessee will be expected to archive the full acoustic record at National Centers for Ecological Information and to submit baleen whale detections to BOEM BSEE and NMFS at least twice a year. Category: B GACP Comment: This measure would siphon finite resources from conservation efforts that may offer more protection or potential benefit to marine mammals. This measure increases what had been a requirement of 3 years of operational monitoring (up to 10 if there was a demonstrated need) to at least 10 years. BOEM should demonstrate why additional monitoring is needed and what impact this would mitigate. A long-term archival passive acoustic monitoring (PAM) network (now proposed as at least 10 years) would be very costly and it is unclear to what extent it would enhance environmental protections. A requirement to deploy this PAM network 1 year before construction has the potential to cause extremely disruptive delays to projects as COPs may be approved less than 1 year before construction activities commence. If BOEM wishes to establish such a requirement that's applicable to a class of projects (e.g. offshore wind farms) it should be proposed through a legally required process that should provide opportunity for outreach to industry and public review and comment.	and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MM-3 has been revised with additional details about long-term PAM monitoring. A regional PAM network is being developed and will include PAM contributions from industry, researchers, and state and federal stakeholders. At least 3 but not more than 10 years of monitoring is justified based, in part, on the life history of the whales being monitored and of concern. Opportunities have been provided to discuss the long-term PAM network with industry and the idea behind the PAM network is to monitor for changes in marine mammal presence (using vocalizations as a proxy for presence); therefore, pre-construction monitoring is necessary to determine if there are any changes. This information can inform mitigation with the best available knowledge, in particular spatio-temporal measures. Furthermore, if this AMMM measure is made a T&C at the COP-approval level, developers can anticipate the 1-year pre-construction requirement well in advance of construction.
BOEM-2024-0001-0450-0059	Measure ID and Name: MM-3: Long-term PAM monitoring Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "The Lessee must conduct archival continuous and long-term PAM to develop baselines and monitor changes in the presence of marine species as well as changes in ambient noise for 1 year before construction through at least 10 years of operations As an alternative to conducting PAM in its project area the Lessee may opt to pay into BOEM's Environmental Studies Fund on an annual basis to support long-term	Thank you for your comment.

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	monitoring (equipment deployment data processing and archiving)all done in a pooled approach with the RWSC in lieu of doing it themselves. Notes: We support measure MM-3 which provides for either long-term PAM monitoring of the lease area or contributions to BOEM's Environmental Studies Fund to support long-term PAM monitoring. We do not recommend any changes to MM-3.	
BOEM-2024-0001-0469-0020	AMMM measure MM-3 states that lessees must conduct baseline archival long-term and continuous passive acoustic monitoring ("PAM") for one (1) year before beginning construction. When COA staff asked why the pre-construction monitoring requirement was not longer BOEM representatives cited the expeditious timeline of wind projects and indicated that from a scientific perspective it would be ideal if there was twenty (20) years of baseline monitoring available. Comparing the actual requirement and the ideal it appears that development timelines were much more heavily favored than robust scientific study. Without a sufficient baseline it will be difficult for BOEM to determine the true effects of OSW development on marine mammals as the baseline could be significantly skewed depending on annual variabilities. This is especially concerning given that BOEM plans to rely on monitoring the effects of early OSW projects to refine the required mitigation and impacts analysis for later ones. BOEM should extend the requirement for pre-construction baseline PAM.	BOEM believes that 1-year baseline is sufficient for the NY Bight region because there are ongoing PAM efforts already underway in NY Bight, which could provide more than a year of baseline data.

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BOEM-2024-0001-0450-0024	D. MM-3 Long-Term PAM Monitoring1. Support for Ten Years Post-Construction Passive Acoustic Monitoring BOEM is proposing that the lessee must conduct archival continuous and long-term passive acoustic monitoring (PAM) to develop baselines and monitor changes in the presence of marine species as well as to changes in ambient noise for one year before construction and through at least ten years of operations (MM-3). To meet this requirement BOEM provides two options for the Lessee: 1) deploy passive acoustic monitoring platforms and collect and analyze data in concordance with the best practices outlined in the Regional Wildlife Science Collaborative (RWSC) Science Plan; or 2) pay into BOEM's Environmental Studies Fund on an annual basis to support long-term monitoring carried out in concordance with RWSC best practices (developers would not be required to submit a Long-Term PAM Plan if they choose this option).A regulatory requirement in support of establishing a robust and long-term acoustic monitoring program is timely and of significant import. For highly mobile species with long generation times such as large whales regional and multi-year passive acoustic monitoring studies have been essential in improving understanding of species' long-term distributional shifts largely occurring because of climate change impacts on the distribution of preferred prey species. [Footnote 123: E.g. Davis G. E. Baumgartner M. F. Bonnell J. M. Bell J. Berchok C. Bort Thornton J. ... & Van Parijs S. M. (2017). Long-term passive acoustic recordings track the changing distribution of North Atlantic right whales (Eubalaena glacialis) from 2004 to 2014. Scientific reports 7(1) 13460; Davis G. E. Baumgartner M. F. Corkeron P. J. Bell J. Berchok C. Bonnell J. M. ... & Van Parijs S. M. (2020). Exploring movement patterns and changing distributions of baleen whales in the western North Atlantic using a decade of passive acoustic data. Global Change Biology 26(9) 4812-4840.] The continuation of long-term passive acoustic monitoring studies and their expansion specifically within offshore wind lease areas will be critical to monitor any effects of offshore wind development on these species and perhaps more importantly the ability to discriminate the effects of offshore wind development relative to those of climate change effects or natural variation. The establishment of an acoustic baseline for offshore wind development	Thank you for your comment.

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	areas and the monitoring of changes to that baseline over time is also critical to the effective adaptive management of the offshore wind industry. While pile driving noise during construction remains the primary acoustic impact of concern low frequency continuous noise generated during turbine operations and project-associated vessels also has the potential to affect marine life. Offshore wind projects are expected to be developed simultaneously and consecutively in the New York Bight and other regions of the U.S. East Coast for at least the next decade. Understanding the relative contribution of noise from different offshore wind- related sources to the overall soundscape will better inform our understanding of impacts and advise adaptive management. For example such information could inform construction schedules to reduce cumulative acoustic impacts or be used to identify times and/or areas that may benefit from reduced levels of vessel traffic as well as providing clarity on the acoustic footprint resulting from operational turbine arrays (see also the adaptive management plan proposed for operational noise in Section V.C.1).In light of the above considerations we stand in strong support of BOEM's proposed long-term PAM monitoring requirement as written in the Draft PEIS (MM-3).	
BOEM-2024-0001-0532-0005	Marine Mammal Recommendations - Need for Universal Vessel Speed Restrictions: The proposed use of NARW Strike Management Plans in the Draft PEIS fails to sufficiently address the risk of vessel strikes particularly for North Atlantic right whales (NARWs). Given the critical vulnerability of NARWs to vessel collisions and the inadequacy of the proposed speed limit measures BOEM should mandate a more comprehensive approach to vessel strike reduction including more expansive speed restrictions and enhanced monitoring measures.- Mitigation of Noise from Impact Pile Driving: Establishing limits to the noise produced by turbine installation is essential to protect marine mammals from auditory injury and other impacts and reduce harm to other marine species. BOEM should adopt the sound level limits for impact pile driving as proposed in the Draft PEIS.- Need for Comprehensive Vessel Noise Mitigation: To effectively reduce underwater noise levels BOEM should encourage the acquisition of quiet ship notations for all project-associated	Thank you for your comment.

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	vessels and require lessees to create underwater vessel noise management plans with measures that will minimize vessel noise.- Long-Term Passive Acoustic Monitoring (PAM): The requirement for long-term PAM monitoring outlined in the Draft PEIS is crucial for establishing baselines and monitoring changes in marine species presence and ambient noise. BOEM should maintain the proposed ten-year post- construction PAM monitoring requirement to ensure effective assessment of offshore wind development's impact on marine life and inform adaptive management strategies.- Improved Sound Field Verification Process: BOEM's proposed improvements to the sound field verification (SFV) process for impact pile driving will significantly enhance oversight of adherence to regulatory thresholds to protect marine mammals from noise generated during pile driving. Clear communication channels immediate reporting of deviations from regulatory thresholds and public transparency of SFV monitoring reports would further help ensure regulatory compliance and foster public trust in offshore wind development practices.	
BOEM-2024-0001-0423-0021	[bold: MM-5] would require all offshore wind-related vessels to travel at 10 knots or less while transiting from US ports to lease areas and within lease areas unless a NARW Strike Management Plan is submitted to BOEM BSEE and NMFS.[bold: MMST-13] requires that from Nov 1 - May 14 all vessels must travel at 10 knots or less when transiting to/from or within the wind development area with the exception of CTVs if there is at least one visual observer on duty at all times aboard the vessel to visually monitor for large whales and real-time PAM is conducted.MM-5 and MMST-13 would impose vessel speed restrictions of 10 knots that no other marine traffic is required to meet. NOAA has regulations requiring most vessels 65 feet or longer to travel at 10 knots or less in Seasonal Management Areas along the U.S. East Coast at certain times of the year and is in the process of expanding applicability and duration of those regulations. MM-5 and MMST-13 appear to be an incredibly broad expansion to the geographic management areas the subject vessels and the seasonal time restrictions without any robust regulatory process and exclusively towards the activities of the offshore wind industry. If these measures are in fact needed to reduce impacts from vessels they should be promulgated for all vessels through the	MM-5 and MMST-12 have been previously applied and remain in the document as AMMM measures for consideration. MMST-12 language is an updated version of PDC-4 language from BOEM's Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf). MMST-13 has been removed and incorporated into MMST-14.

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	regulatory process. [bold: MMST-12] sets marine mammal and sea turtle geophysical survey clearance and shutdown zones during use of certain sound-producing equipment. This restriction is in direct contradiction to both past precedent as well as BOEM's very recent publication on [italicized: "Categorizing active marine acoustic sources based on their potential to affect marine animals"] (Ruppel C.D. et al. 2022 Journal of Marine Science and Engineering. 10:1278). BOEM's own analysis in that publication was that most high resolution geophysical sources are unlikely to result in harassment and should be treated as de minimis. If a geophysical survey includes no impactful equipment as determined by [italicize: Ruppel] such a survey should be exempted from this requirement.	
BOEM-2024-0001-0342-0002	The Commission offers the following comments regarding specific AMMM measures Alternative Monitoring Plan (MMST1) The measure states that the alternative monitoring plan shall have two parts one for foundation pile driving during low-visibility conditions and one for nighttime and that each part must demonstrate the effective use of technologies that the Lessee is proposing to use. The specific requirements for the "Nighttime Pile-Driving Monitoring" part of the plan include demonstrating "the capability of the proposed monitoring methodology to detect marine mammals and sea turtles within the full extent of the established clearance and shutdown zones with the same effectiveness as daytime visual monitoring" and discussing "the efficacy (range and accuracy) of each device proposed for nighttime monitoring as demonstrated by field trials". However similar requirements are missing from the "Low-Visibility Pile-Driving Monitoring" part of the plan. The final PEIS should require lessees to demonstrate the efficacy of monitoring methods for both low- visibility and nighttime pile driving.	Thank you for your comment. MMST-1 has been revised and updated to address these recommendations. BOEM reviews plans to make sure monitoring plans are effective.
BOEM-2024-0001-0342-0003	Foundation pile-driving measures (MMST4) The measure states that monitoring must be conducted from 30 minutes immediately prior to initiation of foundation pile-driving activities through 30 minutes post-completion of foundation pile-driving activities. However a 60-minute pre-installation clearance time for both visual observations and passive acoustic monitoring (PAM) has been included in recent final rules issued by NMFS for the	Thank you for your comment. MMST-4 has been revised and updated to address these recommendations. BOEM is taking the recommendations into consideration for any additional potential changes in the future.

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	taking of marine mammals incidental to other wind turbine construction projects in the Atlantic [Footnote 1: e.g. Dominion Energy Virginia (89 Fed. Reg. 4370; 23 January 2024) and Empire Wind (89 Fed. Reg. 11342; 14 February 2024).] and should be included in the final PEIS. In addition the measure should require that PAM be conducted for at least 24 hours prior to pile driving and PAM data from the previous 24 hours be reviewed prior to initiation of foundation pile driving consistent with NMFS's requirements for the same final rules.	
BOEM-2024-0001-0422-0018	MMST-13 Vessel speed requirements November 1 through May 14 Comment #16 on MMST-13 The specificity in this AMMM is premature given the ongoing finalization of NMFS's Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule. Attentive Energy urges BOEM to defer to or reference the final vessel speed rule in this AMMM rather than create requirements that potentially may not comport with the finalized rule.	Thank you for your comment. BOEM is monitoring the final rule and will revisit it at the project-specific stage. MMST-13 was removed and incorporated into MMST-14.
BOEM-2024-0001-0347-0004-a	MUL-20: ASGA has been concerned about the impacts on marine species and fisheries due to construction activities. Utilizing a soft start for impact pile-driving could allow sensitive marine species time to vacate the installation area before intense pile-driving begins.	Thank you for your comment. MUL-20 has been revised to clarify use of a soft-start protocol in the PEIS.
BOEM-2024-0001-0342-0004	Metrics for Received Sound Level Limit (RSLL [Footnote 2: The RSLL cannot be exceeded beyond (a) 1500 m from the foundation as of 1 May 2026 (b) 1000 m from the foundation as of 1 May 2028 and (c) 750 m from the foundation as of 1 May 2030.]; MUL22)The measure states that "sound fields generated during impact pile driving must not exceed NMFS's Level A permanent threshold shift limits for low-frequency cetaceans (LFC)" and that "every attempt must be made to reach the RSLL at 100 percent of foundations." However the measure does not indicate what metric RSLL would be based on peak or cumulative sound exposure level (SELcum). The measure should stipulate that the RSLL should be based on the SELcum threshold for LFC during installation of each foundation pile in the final PEIS.	Thank you for your comment. MUL-22 has been revised for clarification in the PEIS.
BOEM-2024-0001-0422-0007	MUL-22 Received Sound Level Limit ("RSLL") Comment #5 on MUL-22	Thank you for your comment. MUL-22 has been revised for clarification in the PEIS. BOEM is taking the recommendations

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	Attentive Energy has conducted a feasibility analysis on achieving these proposed underwater noise standards. There are several limiting factors to achievability including site-specific conditions such as sediment substrate and water depths greater than 40 meters. Currently achievability of these standards would only be feasible with pile diameters between 1 meter and 2 meters. For a low attenuation environment as soon as the diameter of the piles is 4 meters or more the efficiencies of the noise abatement systems must be greater than 20 dB which is not guaranteed. Current monopile diameters based on latest turbine sizes and water depths in the New York Bight are approaching 12 meters. Attentive Energy understands that BOEM is attempting to motivate the offshore wind industry to further reduce sound propagation levels. However Attentive Energy does not believe that these proposed levels are reasonably achievable and it is unclear analysis BOEM used to determine feasibility. Alternatively BOEM should revise this AMMM to be based upon a standard of reasonable practicability. Reasonably practicable means practicable having regard to (a) the severity and scope of the hazard or risk concerned; (b) the state of knowledge reasonably available concerning that hazard or risk and of any means of removing or mitigating that hazard or risk; (c) the availability and suitability of means to remove or mitigate that hazard or risk; and (d) the costs and the benefits of removing or mitigating that hazard or risk. Prior to proposing this AMMM has BOEM conducted a risk assessment / risk management process that addresses the following: What is the actual quantitative level of risk? Are risk reduction measures warranted? What are the incremental efficacies of individual risk management/reduction measures? Do unacceptable levels of risk reduction persist after the employment of other measures? Does the inclusion of near real-time PAM effectively contribute to residual risk reduction? Do existing mitigation measures individually or in combination sufficiently limit any remaining residual risk? In its General Comments section of this letter Attentive Energy recommends an additional alternative be included in the Final PEIS that allows for the	into consideration for any additional potential changes in the future.

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	assessment of how well newly proposed AMMMs perform versus the existing AMMMs. If such an alternative is included it would allow for the assessment of the performance of this RSLL AMMM as just suggested.	
BOEM-2024-0001-0423-0006	[bold: MUL-22] would set sound fields generated during impact pile driving at levels that cannot be met by any existing technology. The stiff soils found in the NY Bight area[Footnote 1: "Glauconite sands could potentially be present within the six NY Bight lease areas . . ." Draft PEIS at 3.5.2-6.] combined with the known size and characteristics of the jacket and monopile foundations that could be required to develop offshore wind in the NY Bight mean that significant energy will be needed to drive each pile (i.e. a large number of blows at medium to high hammer energies). This necessarily means that a large amount of underwater sound will be emitted. Even with optimized installation techniques and use of a double bubble curtain (the most effective attenuation that BOEM and NOAA Fisheries have accepted in modelling to date) the Received Sound Level Limit expected from any project is least an order of magnitude farther out than the 750-meter distance that would be required as of May 1 2030. This requirement in the Draft PEIS is an impossible condition that no project in the region could meet. As sound levels are partially dependent on soil conditions any mitigations for sound level issues should be evaluated through the COP specific NEPA process when site-specific soil data is available for the analysis. It appears that BOEM may be using this condition to encourage the development of new technology to mitigate these impacts however the lessees are not manufacturers and do not have the capability to create new installation technologies that would meet this standard. BOEM must consider the state of existing technologies and site-specific conditions in its application of AMMMs. Sound sensitive species can be protected from any harm through a thoughtful and project-specific program that will draw upon best practices and available technologies (some of which may not even exist at this time but may be available at the time of project construction) that are species-specific site- specific and time-of-year specific. A carefully tailored program that hews to the NEPA principles of avoidance first minimization second and mitigation as a	Thank you for your comment. MUL-22 has been revised for clarification in the PEIS. BOEM is taking the recommendations into consideration for any additional potential changes in the future.

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	fall- back is greatly preferable to a cookie-cutter approach of grossly unreasonable pre-determined sound fields established many years prior to construction.	
BOEM-2024-0001-0439-0069	Measure ID: MUL-22 Measure Name: Received Sound Level Limit (RSLL) Description: Sound fields generated during impact pile-driving must not exceed NOAA Fisheries' Level A permanent threshold shift (PTS) limits for low frequency cetaceans (LFC) by the specified date and at the distances below. Every attempt must be made to reach the Received Sound Level Limit (RSLL) at 100% of foundations. Voluntary: May 1 2025: After the first three foundations no exceedance of RSLL beyond 4921 feet (1500 meters) from the foundation for 90% of remaining piles. Required: May 1 2026: After the first three foundations no exceedance of RSLL beyond 4921 feet (1500 meters) from the foundation for 90% of remaining piles. May 1 2028: After the first three foundations no exceedance of RSLL beyond 3280 feet (1000 meters) from the foundation for 90% of remaining piles. May 1 2030: After the first three foundations no exceedance of RSLL beyond 2460 feet (750 meters) from the foundation for 90% of remaining piles. On a case-by-case basis BOEM may consider an exception to the RSLL if the Lessee provides sufficient written justification as determined by BOEM of why meeting the RSLL is not technically and commercially practicable. In these cases compensatory mitigation (or similar) may be considered such as operator contributions to research and monitoring or similar that reduce noise or contribute to a better understanding of noise reduction. Previously Applied as a COP T&C: Category: G T/E BACP Comment: This AMMM is problematic for the following reasons: It is premature to implement new requirements on sound mitigation prior to a thorough and complete analysis of learnings from the construction of the South Fork Wind Farm and Vineyard Wind 1 projects including measured sound fields sound abatement techniques relative effectiveness of mitigation and monitoring measures and documented exposures above relevant thresholds. Ignoring this experience robs BOEM and the industry of the opportunity to learn and improve based on the most recent science and practical considerations. It remains unclear how and to what extent the proposed thresholds will reduce the amount of acoustic	Thank you for your comment. MUL-22 has been revised for clarification in the PEIS. BOEM's development of the AMMM measures was performed in coordination with NMFS, and BOEM has provided opportunities for industry to offer comments and feedback as measures have been developed.

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	exposure and whether these reductions meaningfully increase protection of marine wildlife. Empirical data compiled from projects in construction should be presented and discussed at the joint forums. This discussion could also help inform level B harassment numbers that are based on older science and that merit further validation. This measure fails to account for trends in offshore wind technology particularly the use of larger wind turbines and associated larger foundations and piles. Large turbines are essential to make efficient use of the nation's offshore wind resource and to meet President Biden's offshore wind and climate goals myriad State goals and individual projects' offtake agreements. The proposed guidance is based on experience with the 6- megawatt (MW) turbines used at the CVOW research project which are substantially smaller than the utility-scale projects currently in construction at South Fork Wind Farm (11 MW) and Vineyard Wind 1 (13 MW). In addition NY Bight leases have bid on state offshore wind procurements using 18 MW WTGs to calculate their power production and bid prices. Moreover manufacturers are already developing new larger turbines and foundations and will likely stop producing smaller turbines and foundations in the future. Any new measures should reflect both the experience of current construction projects and the anticipated industry standard turbines sizes over the next decade. Failure to do so will stunt the development and use of commercially available technologies in the United States hampering project viability and putting the country at a competitive disadvantage against the rest of the world. This measure is another example of BOEM shifting the burden to prove infeasibility to industry rather than BOEM ensuring that mitigation measures being applied are reasonable. BOEM had recently proposed reducing the threshold to 1500m for near term projects the agency is apparently now implementing the sound standard at 1km starting in May 2026 in regulatory documents. Supply chain and domestic offshore wind industry investments for projects are made well before a project is built. Prior to the implementation of such a standard there needs to be robust evidence that any applicable limit would be technically and economically feasible. This is a prime example of why these guidelines must be developed collaboratively with industry so that	

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	unintended consequences are avoided before they become barriers to development. This measure also creates a potential regulatory roadblock as it would establish limits that are inconsistent with current National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) practice. In particular standard practice in Marine Mammal Protection Act (MMPA) incidental take authorizations is currently for NOAA NMFS to establish marine mammal harassment zone sizes based on a modeled 10 dB reduction in pile driving sound. If BOEM were to implement its proposed 1km Level A harassment threshold limit for its Endangered Species Act (ESA) Section 7 consultations it would create a discrepancy between the proposed actions by NOAA NMFS (via proposed MMPA incidental take authorization) and BOEM (via ESA Section 7 Biological Assessment). This would in turn create a significant challenge during the ESA Section 7 consultation process. The ESA requires that NOAA NMFS limit the exemption of take to that which is reasonably certain to occur; dual proposed actions that are inconsistent with one another would create confusion as to what outcome is reasonably certain to occur. .- These concerns highlight why BOEM must go through a robust guidance development process before imposing these measures on projects. A NEPA document focused on specific lease areas is not the appropriate venue for seeking feedback on such measures. This measure must be removed from consideration in the FEIS and instead if BOEM decides to propose such a measure despite the justifications for its removal listed above BOEM should engage in a robust public guidance development process that includes a public comment period workshops and outreach to industry stakeholders.	
BOEM-2024-0001-0450-0069	Measure ID and Name: MUL-22: Received Sound Level Limit (RSLL) Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):"Sound fields generated during impact pile-driving must not exceed NOAA Fisheries' Level A permanent threshold shift (PTS) limits for low frequency cetaceans (LFC) by the specified date and at the distances below. Notes: We support BOEM's establishment of received sound level limits for impact pile-driving to avoid Level A PTS. We do not recommend any changes to MUL-22.	Thank you for your comment.

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BOEM-2024-0001-0439-0020	c. BOEM should remove AMMMs that are technically and economically infeasible. As stated above NEPA requires agencies to "study develop and describe technically and economically feasible alternatives" [Footnote 44: 43 U.S.C. 4331.] A number of the newly proposed AMMMs are technically and economically infeasible will create unsafe conditions and/or impose undue burden on developers (see Attachment A for additional examples).MUL-22 - Received Sound Level Limit: It is premature to implement new requirements on sound mitigation prior to a thorough and complete analysis of learnings from the construction of the South Fork Wind Farm and Vineyard Wind 1 projects including measured sound fields sound abatement techniques relative effectiveness of mitigation and monitoring measures and documented exposures above relevant thresholds. Ignoring this experience robs BOEM and the industry of the opportunity to learn and improve based on the most recent science and practical considerations. It remains unclear how and to what extent the proposed thresholds will reduce the amount of acoustic exposure and whether these reductions meaningfully increase protection of marine wildlife. Empirical data compiled from projects in construction should be presented and discussed at the joint forums. This measure fails to account for trends in offshore wind technology particularly the use of larger wind turbines and associated larger foundations and piles. Large turbines are essential to make efficient use of the nation's offshore wind resource and to meet President Biden's offshore wind and climate goals myriad State goals and individual projects' offtake agreements. Finally mitigation measures for marine wildlife fall under NOAA's authority under the MMPA.MUL-29 - Sound Field Verification (SFV) Process Plan and Reporting: This process will result in significant construction delays to projects and is not economically or technically feasible. Requiring SFV at every turbine location would be unnecessary and cost prohibitive. A standardized target sub-sample of turbine locations would be more than sufficient to determine the effectiveness of sound reduction mitigation measures. Empirical data compiled from the projects currently conducting SFV could be discussed at our proposed BOEM-industry forum and would inform a broader discussion on how best to incorporate lessons learned from early	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-22 and MUL-29 have been revised for clarification in the PEIS. AQ-1 through AQ-3 are RPs.

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	projects. This measure could also unintentionally exacerbate stressors on marine mammals. For example construction time could be extended unnecessarily to accommodate repeated attempts to reduce sound to a specific level (e.g. start-up test fail sound limit shut down add bubble curtain start-up fail by lesser degree shutdown and so on). Also more extensive sound field verification requires additional vessels and equipment which counterproductively adds to the ambient sound level. AMMMs AQ-2 and AQ-3 require lessees to replace diesel fuel and marine fuel oil with alternative fuels such as natural gas propane or hydrogen for vessels and require the replacement of combustion engines with zero-emissions technology (fuel cell-electric or battery- electric) for vessels. Requiring developers to use alternative fuels or zero-emissions technology would severely limit project feasibility since the supply chain for vessels both current and new builds would be constrained to very few vessels globally. Considering the benefits of GHG reductions from deployment of offshore wind power the burden of this mitigation measure is disproportionate given the magnitude of GHG emissions during the relatively brief construction period. AMMMs AQ-2 encourages lessees to replace diesel fuel and marine fuel oil with alternative fuels. Requiring a technical and/or economic feasibility analysis for not using these vessels places an undue burden on developers because of the lack of these vessels in the market both now and in future construction trends. While there are over 25 different types of vessels needed to construct and maintain an offshore wind project[Footnote 45: See https://cleanpower.org/resources/offshore-wind-vessel-needs/.] ACP did an analysis of 5 vessel types that provide a good representation of the vessel size and work scope across the industry including Crew Transfer Vessels Heavy Lift Vessels Rock Installation vessels Service Operation Vessels and Survey Vessels. ACP evaluated how many vessels with alternative fuels exist and how many global vessels are planned for construction or modification from 2024-2027 excluding China. ACP found that of the current fleet only 2% of these five vessel types have alternative fuels. Of these five vessel types under construction between 2024-2027 33% will be fueled by alternative fuels. And 7% of these vessels under modification will	

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	have the capacity to use alternative fuels. In total that means only 5% of the global market (excluding China) of these five vessel types will be fueled by alternative fuels. As offshore wind ambitions grow in both Europe the U.S. and other markets these vessels will be in short supply. With vessel availability already a challenge for U.S. projects pushing developers to only hire 5% of available vessels places undue burden on projects and is infeasible.[See original attachment for table titled Alternate Fuel Available by Supply Type]AMMMs AQ-2 encourages lessees to replace combustion engines with zero-emissions technology (fuel cell-electric or battery-electric) if feasible for vessels equipment and vehicles engaged in activities on the OCS. Similar to AQ-1 requiring a technical and/or economic feasibility analysis for not using these vessels places an undue burden on developers because of the lack of these vessels in the market both now and in future construction trends. ACP did a similar analysis for the availability of ESS and Shore Power capability of the same 5 representative vessel types in the current market and under construction and modification between 2024-2027. In the current market 5% of vessels have ESS capability 21% of those under construction and 10% of those under modification excluding China. In total looking at current supply and vessels under construction and modification 5% of vessels will have ESS capability.[See original attachment for table titled ESS]Shore power capacity is even less common. Current vessel availability with shore power is 1% of the global market. 4% of vessels under construction 2024-2027 will have shore power and 7% of vessels under modification. In total in 2027 only 2% of these 5 representative vessels will have shore power capacity.[See original attachment for table titled Shore Power]A programmatic NEPA review focused on a specific region is not the appropriate vehicle to test out new measures and receive feedback from stakeholders on feasibility. As demonstrated above these measures are infeasible unreasonable and requiring each lessee to prove their infeasibility during the project specific COP review places an undue burden on the industry. The onus should not be on the industry to justify why a measure is infeasible but instead the agency should demonstrate that the AMMMs result in reduced impacts.	

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	These measures should be removed prior to the publication of the Final PEIS.	
BOEM-2024-0001-0342-0005	Abbreviated Sound Field Verification (SFV) Checks (MUL29) The measure states that an Abbreviated SFV Check must be conducted for every pile at 750 m (1) to verify that the RSLL has been met and (2) to document that the measured sound levels do not exceed the injury and behavior thresholds. However the measure does not indicate what metric the Abbreviated SFV Check should be based on a single-strike SEL (SELs-s) [Footnote 3: In Europe the threshold is based on a SELs-s sound level at 750 m. If SELs-s is the intended metric BOEM must specify whether the mean or maximum SELs-s should be used for each pile.] or SELcum nor does it specify what method should be used to extrapolate that metric to distances of 1000 and 1500 m to confirm the RSLL has been met from 1 May 2026 to 30 April 2030 and various other distances for the Level A and B harassment zones. If BOEM intends to use the Abbreviated SFV Check to verify that the RSLL has been met then the SFV Check should be based on the SELcum metric and a second hydrophone should be placed (1) 1500 m from the foundation from 1 May 2026 to 30 April 2028 and (2) 1000 m from the foundation from 1 May 2028 to 30 April 2030. The measure also must stipulate how the operators should extrapolate the measured sound levels to the various Level A and B harassment zones [Footnote 4: e.g. by using the measured sound propagation loss from the most recent and/or applicable Thorough SFV Monitoring by comparing to the maximum measured sound level at 750 m from the most recent and/or applicable Thorough SFV and assuming sound propagation conditions are similar by comparing to the modeled sound level at 750 m etc.] when conducting Abbreviated SFV Checks in the final PEIS. The Commission recommends that BOEM incorporate all aforementioned changes into the final PEIS for New York Bight wind energy construction operation and decommissioning activities.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-29 has been revised for clarification in the PEIS.
BOEM-2024-0001-0422-0012	MUL-29 Sound Field Verification ("SFV") Process Plan and Reporting Comment #10 on MUL-29 Requiring sound field verification at every turbine location is unnecessary and cost prohibitive. This process will result in significant construction delays to projects and is not economically or	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs,

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	technically viable. A standardized sub-sample of turbine locations would be sufficient to determine the effectiveness of sound reduction mitigation measures and should be the approach described in this AMMM. Additionally BOEM should clarify that a single Monitoring Report would be required per this AMMM after all foundation installations are complete and not after each individual foundation installation. It will be extremely difficult to produce a single report with 48 hours of completion of all foundation installation and it is unclear why such a report is needed within such a short timeframe. Can BOEM explain the value of having the report so expeditiously? Attentive Energy recommends providing some flexibility in report timing (e.g. within 10 days) to make this AMMM more feasible. Attentive Energy also feels this measure could unintentionally increase exposure to stressors to marine mammals by unnecessarily extending construction time to accommodate repeated attempts to reduce sound to a specific level and because more extensive sound field verification requires additional vessels and equipment. Additional vessels in the field results in additional increased risk of collision with marine mammals and sea turtles as well as health safety and environmental risk exposure to vessel personnel a higher risk associated with operating multiple vessels in close proximity and higher emissions during construction. BOEM should weigh these factors against any additional protection that may result from stricter sound thresholds and SFV at each turbine location.	and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-29 has been revised for clarification in the PEIS.
BOEM-2024-0001-0423-0007	[bold: MUL-29] would require sound field verification (SFV) at every single pile during construction. This is a new and significantly costly requirement that would greatly increase construction times and the cost of the project. Where SFV is shown to be in line with modelled sound projections at the first few piles there is insufficient justification to requiring SVF at every other pile as its significant cost would yield very marginal benefits.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-29 has been revised for clarification in the PEIS.

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BOEM-2024-0001-0439-0076	Measure ID: MUL-29 Measure Name: Sound Field Verification (SFV) Process Plan and Reporting Description: The purpose of the SFV Process is to (1) verify the RSLL has been reached and (2) document sound propagation from foundation installation for estimating distances to isopleths of potential injury and harassment to verify that the modeled acoustic fields were conservative enough to not underestimate the number of exposures of protected marine life to sounds over regulatory thresholds. Process SFV must be conducted at every pile at 2460 feet (750 meters) (Abbreviated SFV Check). Thorough SFV Monitoring (defined as recording along a minimum of two radials with at least one radial containing three or more recorders) must be conducted for the first three foundations of a project and when a foundation is to be installed with a substantially different set of values for key parameters including foundation type pile size installation method hammer energy rating water depth seabed composition and season. Further if levels measured in any SFV (Thorough or Abbreviated) imply the exceedance of authorized ranges to regulatory thresholds (specified by either the RSLL or approvals documents) Thorough SFV Monitoring must be conducted until SFVs from three consecutive foundations demonstrate adherence to the authorized levels following a foundation that exceeds said limit. Further the Lessee must comply with other Terms and Conditions directing action should SFV-measured ranges exceed those authorized. See Chapter 3 of BOEM's Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans for more information. SFV Plan The Lessee must submit an SFV Plan for review and written approval by BOEM and BSEE (TIMS) in consultation with NMFS and USACE (when applicable) 120 days before the planned commencement of field activities for pile-driving. The SFV Plan must be sufficient to assess sound propagation from the foundation and the distances to isopleths for potential injury and harassment as well as the RSLL when applicable. The measurements must be compared to the modeled Level A and Level B harassment zones for marine mammals (and the injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon) and the plan should include the target modeled sound levels that	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-29 has been revised for clarification in the PEIS.

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	each monitored installation is expected to stay below. The SFV Plan should include approximations of the expected variation of the key parameters across the project and an estimate of how many Thorough SFV Monitoring locations will be required to cover this variation. The plan must describe how the Lessee will ensure that the locations selected for Thorough SFV Monitoring are representative of the rest of the foundations of that type to be installed. The plan must include an Abbreviated SFV check where at minimum a single recorder is placed 2460 feet (750 meters) from the installation of any foundation not requiring Thorough SFV Monitoring to ensure that inherent variability does not result in received levels above what was analyzed within the permitting/authorization/assessment/NEPA process or the RSLL whichever is smaller. The plan must include measurement procedures and results reporting that meet ISO standard 18406:2017 (Underwater acoustics Measurement of radiated underwater sound from percussive pile-driving). The plan must include an example reporting template for both Thorough SFV Monitoring and Abbreviated SFV Check. All comments on the SFV Plan must be addressed to BOEM/BSEE's satisfaction before any pile-driving activities can commence. A copy of the approved SFV Plan must be in the possession of and followed by any Lessee designees operating under the authority of the approved COP and carrying out the requirements on site. The submission of raw acoustic data or data products associated with SFV to BOEM may be required. SFV Reporting Thorough SFV Monitoring reports must be submitted to BOEM BSEE (TIMS) NMFS and USACE (when applicable) within 48 hours of completion of foundation installation. Abbreviated SFV Check reports must also be submitted to BOEM BSEE (TIMS) NMFS and USACE (when applicable) but may be submitted in weekly batch reports as long as Abbreviated SFV Check measurements are in compliance with all applicable regulatory thresholds (RSLL and/or harassment injury and behavior thresholds). Reports must include modeled and measured distances to isopleths for potential injury and harassment to marine mammals sea turtles and sturgeon. The Lessee is referred to the BOEM Nationwide Recommendations for Impact Pile- Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans	

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	for other recommendations on what should be contained in the report. Previously Applied as a COP T&C: Category:G T/EACP Comment: This process will result in significant construction delays to projects and is not economically or technically viable. See also comments above on MUL 22 and MMST-3Requiring sound field verification (SFV) at every turbine location would be unnecessary and cost prohibitive. A standardized target sub-sample of turbine locations would be more than sufficient to determine the effectiveness of sound reduction mitigation measures. Empirical data compiled from the projects currently conducting SFV could be discussed at our proposed BOEM-industry forum and would inform a broader discussion on how best to incorporate lessons learned from early projects. This measure could also unintentionally exacerbate stressors on marine mammals. For example construction time could be extended unnecessarily to accommodate repeated attempts to reduce sound to a specific level (e.g. start-up test fail sound limit shut down add bubble curtain start-up fail by lesser degree shutdown and so on). Also more extensive sound field verification requires additional vessels and equipment. Additional vessels in the field results in additional Health Safety Security & Environment (HSSE) exposure to personnel a higher risk associated with operating multiple vessels in close proximity increased risk of collision with marine mammals and sea turtles and higher emissions during construction. BOEM should weigh these factors against any minor additional protection if any that may result from stricter sound thresholds and SFV at each turbine location. SFV is also problematic because it doesn't take into account background anthropogenic sources that are picked up during the noise monitoring. The 48-hour reporting timeframe is also unreasonably short. These concerns highlight why BOEM must go through a robust guidance development process before imposing these measures on projects. A NEPA document focused on specific lease areas is not the appropriate venue for seeking feedback on such measures. This measure must be removed from consideration in the FEIS and instead BOEM should engage in a robust public guidance development process that includes a public comment period workshops and outreach to industry stakeholders.	

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BOEM-2024-0001-0450-0071	Measure ID and Name: MUL-29: Sound Field Verification (SFV) Process Plan and Reporting Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):"SFV Reporting Thorough SFV Monitoring reports must be submitted to BOEM BSEE (TIMS) NMFS [Underline: the Marine Mammal Commission (MMC)] and USACE (when applicable) within 48 hours of completion of foundation installation. Abbreviated SFV Check reports must also be submitted to BOEM BSEE (TIMS) NMFS and USACE (when applicable) but may be submitted in weekly batch reports as long as Abbreviated SFV Check measurements are in compliance with all applicable regulatory thresholds (RSLL and/or harassment injury and behavior thresholds). Reports must include modeled and measured distances to isopleths for potential injury and harassment to marine mammals sea turtles and sturgeon. [Underline: Thorough SFV Monitoring reports and Abbreviated SFV Check reports must also be made publicly available within one month after their submission to BOEM and other relevant agencies]. The Lessee is referred to the BOEM Nationwide Recommendations for Impact Pile-Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans for other recommendations on what should be contained in the report." Notes: We support measure MUL-29 which sets out sound field verification procedures for pile driving. We recommend that BOEM require submission of SFV reports to the Marine Mammal Commission (MMC) in addition to BOEM BSEE NMFS and USACE. We also recommend that BOEM add a requirement that lessees make SFV reports publicly available within one month of their submission to BOEM and other relevant agencies.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-29 has been revised for clarification in the PEIS. BOEM is taking the recommendations into consideration for any additional potential changes in the future.
BOEM-2024-0001-0439-0079	Measure ID: MUL-38 Measure Name: Noise mitigation plan Description: Lessees must create a noise mitigation plan to reduce project noise that could potentially constitute a take as defined in the ESA or the MMPA of an endangered or threatened species or marine mammal. The intent of the noise mitigation plan is to ensure Lessees thoroughly assess and minimize potential impactful noise to the maximum extent practicable and that any government-established noise reduction targets (e.g. MUL- 22) are met. The noise mitigation plan may be submitted through the Lessee's initial COP	Thank you for your comment. After additional consideration, BOEM has removed MUL-38.

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	submission or subsequent updated versions but must be finalized prior to initiating construction activities. BOEM and BSEE will review the plan for sufficiency and acceptability. Any outstanding comments must be addressed by the Lessee before the plan is considered final. At a minimum the noise mitigation plan must include: (1) baseline sound characterization (predicted or measured) of their project area; (2) the types duration and levels of unmitigated noise the project will produce; (3) identification of any applicable government-established noise reduction targets; and (4) the operational measures noise abatement technologies and contingency plans (in the case of foreseeable issues) or similar that will be used to meet any existing established noise reduction targets or reduce the overall impact of any noise introduced into the marine environment. On a case-by-case basis BOEM may consider accepting a plan that does not meet established noise reduction targets or where such targets do not exist does not demonstrate reduction of impactful noise to the maximum extent practicable if the plan includes sufficient justification for why this is not possible. In these cases a requirement for compensatory mitigation may be considered. Previously Applied as a COP T&C: Category: D T/EACP Comment: See also comments on MUL-22.This measure is duplicative of the required COP noise assessment and the MMPA LOA process in place to assess mitigation measures to reduce take and therefore should be removed. The PEIS intends to analyze measures that can be approved as terms and conditions of plan approval for individual project specific COPs. Since this measure dictates how a COP should be developed by its very nature it could not be implemented through terms and conditions of COP approval. Requirements for baseline conditions are concerning. Against what baseline would this be measured? The ocean is a noisy place that changes from day-to-day. In addition this measure could result in regulating DP vessel noise. IF DP vessels are determined to exceed noise reduction targets project installation could become technically and economically infeasible as DP vessels are essential for the construction of offshore wind projects.	
BOEM-2024-0001-0450-0073	Measure ID and Name: MUL-38: Noise mitigation plan Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):"Lessees must create a noise	Thank you for your comment. After additional consideration, BOEM has removed MUL-38. Should BOEM reconsider this at a later date, it will consider your recommendations.

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	mitigation plan to reduce project noise that could potentially constitute a take as defined in the ESA or the MMPA of an endangered or threatened species or marine mammal. The intent of the noise mitigation plan is to ensure Lessees thoroughly assess and minimize potential impactful noise to the maximum extent practicable and that any government-established noise reduction targets (e.g. MUL-22) are met... At a minimum the noise mitigation plan must include: (1) baseline sound characterization (predicted or measured) of their project area; (2) the types duration and levels of unmitigated noise the project will produce; (3) identification of any applicable government established noise reduction targets; and (4) the operational measures noise abatement technologies and contingency plans (in the case of foreseeable issues) or similar that will be used to meet any existing established noise reduction targets or reduce the overall impact of any noise introduced into the marine environment. [Underline: The noise mitigation plan must consider items (1)-(4) for noise generated by construction activities including vessel noise and for noise generated during wind turbine operations including vessel noise] Notes: We support MUL-38 which requires lessees to create a noise mitigation plan to reduce project noise. We recommend that BOEM require lessees to consider in the noise mitigation plan noise generated during both the construction phase and the operations phase of offshore wind development including vessel noise at both phases.	
BOEM-2024-0001-0422-0005	MUL-4 Final cable protection in hardbottom Comment #3 on MUL-4 The wording of this AMMM is unclear. Per this AMMM does BOEM intend to make recommendations on the cable protection measures pre- or post-COP approval? A developer will seek to source cable protections measures before the COP is approved and understanding this recommendation as early as possible ideally prior to COP approval is important. Significant deviations from project design assumptions taken before COP approval about cable protection measures will impact project schedule and cost.' BOEM should also confirm the developer's role in determining the final cable protection measures. Finally BOEM should clarify when the "finalized benthic monitoring plan" is required to be completed. Is it post-COP approval?	Thank you for your comment. The AMMM measures identified in the Final PEIS may be required as conditions of approval for activities proposed by NY Bight lessees in their COPs through the COP review and approval process. For example, a finalized Fisheries & Benthic Habitat Monitoring Plan (COMFIS-3) is a condition of COP approval and is driven by the EFH consultation process at the project-specific level. Cable-protection measures are also included in COMFIS-4, which is now identified as an RP that lessees are encouraged to follow. Note MUL-4 has been updated to clarify the language.

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BOEM-2024-0001-0439-0059	Measure ID: MUL-5 Measure Name: Low noise best practices Description: For onshore and offshore project activities and across all phases of construction and operations operators should use equipment technology and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment. See the following as examples: low noise foundation (MUL-6) vessel noise reduction BMP (MUL-7) and the received sound level limit (MUL-22).Previously Applied as a COP T&C: Category: VACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. As Alternative C assumes adoption of all AMMMs as terms and conditions of plan approval for the purposes of the analysis these AMMMs are not in fact voluntary. Adoption of voluntary AMMMs through terms and conditions undermines the very voluntary nature of those measures. Onshore activities are regulated by state and local noise control requirements. This measure should be eliminated as it is too vague. See also comments on MUL-6 7 22.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-5 is being analyzed as an RP within the PEIS.
BOEM-2024-0001-0450-0018	F. MUL-5 Low Noise Best Practices The NY Bight PEIS for offshore marine birds can be informed by several different avian mapping data products e.g. the Marine-life Data and Analysis Team (MDAT) marine bird relative density and distribution models [Footnote 70: Curtice C Cleary J Shumchenia E Halpin PN. 2019. Marine-life Data and Analysis Team (MDAT) technical report on the methods and development of marine-life data to support regional ocean planning and management. Prepared on behalf of the Marine-life Data and Analysis Team (MDAT).] the Northwest Atlantic Seabird Catalog the Manomet Bird Observatory (MBO) Seabird and Cetacean Assessment Program (CSAP) database [Footnote 71: Menza C Kinland BP Dorfman DS Poti M Caldow C (eds.). 2012. A Biogeographic Assessment of Seabirds Deep Sea Corals and Ocean Habitats of the New York Bight: Science to Support Offshore Spatial Planning. NOAA Technical Memorandum NOS NCCOS 141. Silver Spring MD. 224 pp.] and incidental records from eBird among various other sources. In combination these data reveal that the NY Bight and adjacent wind energy lease areas host a diverse assemblage of diving marine birds including sea ducks alcids and loons some or all of which occur primarily during the fall winter or spring months. Although sound	Thank you for your comment. Because seabirds have a similar hearing range as some marine mammal species, the mitigations targeting marine mammals necessarily afford some protection to seabirds, as well. As more information becomes available on noise impacts on seabirds, additional mitigations explicitly for impacts on seabirds will be considered.

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	mitigation measures during offshore wind activities are usually aimed at impacts on marine mammals sea turtles fishes and invertebrates the underwater hearing abilities for diving bird taxa are found to possess hearing thresholds in the frequency band 14 kHz (comparable to seals and toothed whales). [Footnote 72: Hansen KA Maxwell A Siebert U Larsen ON Wahlberg M. 2017. Great cormorants (Phalacrocorax carbo) can detect auditory cues while diving. Science of Nature 104:17; McGrew KA Crowell SE Fiely JL Berlin AM Olsen GH James J Hopkins H Williams CK. 2022. Underwater hearing in sea ducks with applications for reducing gillnet bycatch through acoustic deterrence. Journal of Experimental Biology 225:jeb243953.] Diving marine birds foraging <100 km away from seismic operations change their foraging direction during acoustic disturbances and increase the distance between their feeding areas and the sound source. [Footnote 73: Pichegru L Nyengera R McInnes AM Pistorius P. 2017. Avoidance of seismic survey activities by penguins. Scientific Reports 7:18.] Indeed avoidance distances by diving seabirds to sounds generated from anthropogenic activities manifest at spatial scales up to tens of kilometers very similar to displacement distances reported in cetaceans during seismic surveys. [Footnote 74: Gordon J Gillespie D Potter J Frantzis A Simmonds MP Swift R Thompson D. 2003. A review of the effects of seismic surveys on marine mammals. Marine Technology Society Journal 37:1634.]The existing monitoring framework for the NY Bight PEIS ignores potential adverse injuries from acoustic disturbances to diving birds that might arise from project construction and/or operations. [Footnote 75: Monitoring and mitigation for diving birds is nowhere mentioned in conjunction with underwater acoustic disturbances during project construction activities in the NY Bight PEIS e.g. BOEM 2024 p. G-13.] We refer to lethal or sublethal injury from underwater sound pressure waves caused by high intensity acoustic pulses not to avoidance or temporary displacements that arise solely from avian changes in behavior. Because seabird taxa sensitive to this impact are more prevalent during winter minimization activities like seasonal curtailment may be justified to abate harm. Capable of diving to 140 m depths [Footnote 76: Wanless S Harris JA Morris MP. 1988. Diving	

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	behaviour of guillemot Uria aalge puffin Fratercula arctica and razorbill Alca torda as shown by radio-telemetry. Journal of the Zoological Society of London 216:7381.] Razorbills especially are known to flush readily from loud noises [Footnote 77: Lavers J Hipfner JM Chapdelaine G. 2020. Razorbill (Alca torda). In: Birds of the World v.2. Billerman SM (ed) Cornell Lab of Ornithology Ithaca NY USA. https://doi.org/10.2173/bow.razorb.01] they can occur during winter in the waters of the NY Bight region [Footnote 78: Williams KA Stenhouse IJ Adams EM Connelly EE Gilbert AT Duron M. 2015. Integrating novel and historical survey methods: a comparison of standardized boat-based and digital video aerial surveys for marine wildlife in the United States chapter 12 p. 7. https://briwildlife.org/wp-content/uploads/2021/08/MABS-Project-Chapter-13-Williams-et-al-2015.pdf] and like other alcids they are vulnerable to both displacement and macro- avoidance. [Footnote 79: Robinson Willmott JC Forcey G Kent A. 2013. The Relative Vulnerability of Migratory Bird Species to Offshore Wind Energy Projects on the Atlantic Outer Continental Shelf: An Assessment Method and Database. Final Report to the U.S. Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs. OCS Study BOEM 2013-207. 275 pp.]Densities of diving birds peak during winter on inner and middle shelf habitats [Footnote 80: Figure 42 in Robinson Willmott J Forcey G Vukovich M McGovern S Clerc J Carter J. 2020. Ecological Baseline Studies of the US Outer Continental Shelf: Final Report. Gainesville FL. OCS Study BOEM 2021079 p. 39.] at least in this portion of the Atlantic OCS. Thus seasonal shifting of noisy operations may eliminate acoustic risks to diving birds. Other methods for sound abatement include: (1) establishing safety zones monitored by visual observers[Footnote 81: E.g. the scope of responsibilities for Protected Species Observers (PSOs) could be extended to cover marine birds. PSOs are already required in adjacent projects; see for example Ocean Wind 1 Offshore Wind Farm. 2023. Final Environmental Impact Statement Appendix H Mitigation and Monitoring pp. H-6 H-12.] or passive acoustics and that trigger shut-down or low-power operations if large diving marine bird flocks enter these zones (2) using noise reduction gear like bubble curtains around pile driving and (3)	

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	deploying other noise-source modifications or changes to operational parameters such as soft starts. [Footnote 82: Erbe C Dunlop R Dolman S. 2018. Effects of noise on marine mammals. Pp. 277309 in Effects of anthropogenic noise on animals. Springer New York NY.]	
BOEM-2024-0001-0450-0066	Measure ID and Name: MUL-5: Low noise best practices Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):"For onshore and offshore project activities and across all phases of construction and operations operators should use equipment technology and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment. See the following as examples: low noise foundation (MUL-6) vessel noise reduction [Strikethrough: BMP] (MUL-7) and the received sound level limit (MUL-22)."Notes: We support the recommendation that operators use low noise best practices for all project activities and across all phases of construction and operations. We recommend deleting the word "BMP" (best management practices) in referring to MUL-7. MUL-7 refers to IMO Guidelines which are not intended to function as technical "best management practices. "The IMO Guidelines identify underwater radiated noise reduction approaches and provide a description of underwater noise management planning. Moreover if BOEM adopts the proposed changes to MUL-7 (see below) BOEM should reflect the new title for MUL-7 "underwater vessel noise management plans" in MUL-5 where it currently reads "vessel noise reduction."	Thank you for your comment. MUL-5 has been revised as an RP and BOEM will continue to monitor the state of the International Maritime Organization (IMO) guidelines.
BOEM-2024-0001-0450-0023	C. MUL-5 Low Noise Best Practices; MUL-24 Adaptive management for NMFS Trust Resources; MUL-38 Noise Mitigation Plan1. Mitigation of Noise from Operating Turbines The mitigation proposed by BOEM in its Draft PEIS does not contain measures specific to the reduction of noise from operating turbines. This omission is significant and should be remedied. Operational noise represents one of the principal sources of uncertainty in BOEM's environmental impact analysis. The agency while finding that turbine operations "would result in long-term low-level continuous noise in the project area" concludes that underwater noise would produce only negligible to minor impacts within "a	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.

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	relatively small radius" around the foundations. [Footnote 115: Draft PEIS at 3.5.6-66 to 3.5.6-67.] But BOEM provides only summary support for its conclusion and the available scientific literature is equivocal. Although Betke and Bellman (2023) in examining turbines up to 8 MW did not find that underwater noise trended upward with rated power (a proxy for turbine size) both Tougaard et al. (2020) and Stber and F. Thomsen (2021) looking at piles up to 6 MW did find a clear statistically significant relationship. [Footnote 116: Compare K. Betke and M.A. Bellman Operational underwater noise from offshore wind farms in A.N. Popper J. Sisneros A.D. Hawkins and F. Thomsen eds. The Effects of Noise on Aquatic Life (2023) with J. Tougaard L. Hermannsen and P.T. Madsen How loud is the underwater noise from operating offshore wind turbines? Journal of the Acoustical Society of America 148: 2855-93 (2020) and U. Stber and F. Thomsen How could operational underwater sound from future offshore wind turbines impact marine life? Journal of the Acoustical Society of America 149: 1791-95 (2021).] And while Holme et al. (2023) determined that background acoustic conditions such as from wind and shipping dominated variability in underwater noise at the wind farms they examined they also found that noise levels were higher within the wind farms' perimeter than outside it for uncertain reasons; and they did not perform a soundscape analysis which would more accurately have represented the additive effect of the turbines' noise across the time domain. [Footnote 117:C.T. Holme M. Simurda S. Gerlach and M.A. Bellman Relation between underwater noise and operating offshore wind turbines in Popper et al. eds. The Effects of Noise on Aquatic Life supra.]The fact remains that the European turbines examined in these papers and others are substantially smaller and produce less nominal power than the new generation of 10 MW-plus turbines intended for the New York Bight. Furthermore these European turbines were built in the habitat of coastal odontocetes specifically harbor porpoises and bottlenose dolphins rather than in that of the low- frequency cetaceans that are of greatest concern for East Coast wind development severely limiting the value of what few studies of post-installation impacts are available. It may be that turbine operation will have little effect on baleen whales fish and sea turtles; on the other hand operational	MUL-5 is an RP and, upon further consideration, MUL-24 and MUL-38 have been removed. References cited in this comment have been incorporated into the PEIS. Specific technology will be considered and analyzed at the COP-specific NEPA stage.

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	noise could displace prey degrade foraging or reduce habitat use to some degree over a wind farm's expected 50- year lifetime (with repowering).BOEM requires that lessees use "best practices that produce the least amount of noise practicable" across "all phases of construction and operations" (MUL-5) and prepare a noise mitigation plan "to reduce project noise that could potentially constitute a take" of an endangered species or marine mammal (MUL-38). [Footnote 118: Draft PEIS at G-19 G-29 to G-30.] While we strongly support this approach we recommend that BOEM provide additional clarity for mitigating and managing operating turbine noise consistent with existing knowledge. First we recommend that BOEM require use of direct-drive motors. Stber and Thomsen (2021) in examining acoustic data from some 16 studies of operating wind farms found that direct-drive motors are highly likely to generate less underwater noise than the gear boxes found in earlier generations of turbines. [Footnote 119: Stber and Thomsen How could operational underwater sound supra.] The magnitude of the noise reduction could be significant: A turbine used in Vineyard's Block Island Wind Farm off Rhode Island produced broadband pressure levels that were some 10 dB below those produced by similarly sized geared turbines at the C-Power site in Europe. [Footnote 120: Id. The relative benefit of direct-drive motors is corroborated by Betke and Bellman (2023) supra albeit at lower levels of noise abatement.] Direct-drive motors are now generally employed by offshore wind developers as BOEM recognizes in its Draft PEIS. [Footnote 121: Draft PEIS at 3.5.7-24.] The agency should clarify that they are required. For proposed new measure MUL-40 addressing operational noise see Attachment 2 table 2. Second we recommend that BOEM require lessees to consider engineering solutions that acoustically decouple the turbine from the mast and platform as part of their obligations under MUL-5 and MUL-38. Such an addition would ensure consideration of a problem that until recently has largely been overlooked and would signal to potentially interested engineering companies (including some that our groups have spoken with) that BOEM is interested in the development of such measures. A precautionary approach is necessary here for it is surely far easier to mitigate potential acoustic impacts through	

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	turbine design and engineering than through adaptive management. For proposed new measure MUL-40 addressing operational noise see Attachment 2 table 2.Third and finally we recommend that BOEM as part of its adaptive management plan commit to periodic independent analysis of the data produced through the post-installation monitoring requirements and one or more expert workshops to provide additional review and reflection. Independent analysis and review are not required under the proposed adaptive management measure (MUL-24) which places full responsibility for defining management thresholds integrating new information and taking appropriate action with the lessee. [Footnote 122: Draft PEIS at G-22.] The same commitments would also improve management of other stressors with uncertain long-term consequences such as physical disturbance and down-current hydrological effects. For proposed changes to measure MUL-24 see Attachment 2 table 1.	
BOEM-2024-0001-0450-0026	F. MUL-5 Low Noise Best Practices; MUL-7 Vessel Noise Reduction Guidelines The International Maritime Organization issued Revised Guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life (MEPC.1/Circ.833) that went into effect on October 1 2023 (hereafter "Revised Guidelines). The Revised Guidelines are applicable to any ship and provide guidance on underwater radiated noise reduction approaches as well as on the development of underwater radiated noise management plans for ships. The purpose of the underwater noise management plans is to achieve quieter vessels (in design and/or operation) by encouraging the development of vessel noise targets the identification of design or operational measures that can achieve those targets and the routine monitoring of ship operations to ensure ongoing alignment or improvement of the targets.MUL-7 currently asks lessees on a voluntary basis to follow the most current IMO Guidelines on noise; however the lack of specificity here casts doubt that any real mitigation would be achieved through its application and even if it were it would be difficult to track. MUL-7 should be strengthened to [Bold: require] lessees to create an underwater vessel noise management plan for each vessel used in construction operations and maintenance. The Revised Guidelines	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-5 and MUL-7 are being analyzed as RPs within the PEIS rather than T&Cs. MUL-5 has been updated to remove RP from the language as requested and MUL-7 has been updated for clarification. Regarding a noise management plan, BOEM is taking this into consideration.

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	thoroughly describe and provide templates for such plans which are not meant to be onerous but rather to create the opportunity for vessel owners and operators to critically evaluate their vessel design (if relevant) and operations for quieting opportunities. Having such plans in place could also streamline future developments (e.g. by the IMO) to develop regulatory guidance on vessel noise. To be effective and to ensure alignment with international guidance to minimize vessel noise MUL-7 must reflect the intent of the IMO to encourage the adoption of underwater noise management planning for all vessels. For proposed changes to measure MUL-7 see Attachment 2 table 1.With regard to MUL-5 we support the recommendation that operators use low noise best practices for all project activities and across all phases and appreciate the direct reference to vessel noise reduction. However we find it problematic that MUL-5 references MUL-7 (the IMO Revised Guidelines) as "best management practices." The Revised Guidelines do not identify one or more "best management practices" in the usual sense of that term e.g. an explicit set of proven technologies or measures that has been tested and determined to meet defined standards or criteria. Rather they identify various approaches to reduce underwater vessel noise and provide a description of underwater noise management planning. For this reason we urge BOEM to delete reference to the term "BMP" in MUL-5 ("vessel noise reduction BMP"). Additionally it would be appropriate to add reference to the new Mitigation Measure we propose above to MUL-5. For proposed changes to measure MUL-5 see Attachment 2 table 1.	
BOEM-2024-0001-0352-0008-b	MUL-6: Low noise foundations We generally support this AMMM measure; however careful consideration should be given to the greater amount of impacted habitat with some foundation types that do not require pile driving. This may be more appropriate as a project-specific consideration rather than a programmatic measure.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.

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		MUL-6 is being analyzed as an RP within the PEIS rather than an AMMM measure.
BOEM-2024-0001-0439-0060	Measure ID: MUL-6 Measure Name: Low noise foundations Description: BOEM encourages the use of low noise practices in foundation installation. The use of non-pile-driving foundation types should be considered first. If not practicable then the use of the best available quieting technology should be applied to reach the received sound level limit (MUL-22).Previously Applied as a COP T&C: Category: G D VACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. As Alternative C assumes adoption of all AMMMs as terms and conditions of plan approval for the purposes of the analysis these AMMMs are not in fact voluntary. Adoption of voluntary AMMMs through terms and conditions undermines the very voluntary nature of those measures. This measure also constitutes COP guidance and it is unclear where BOEM has regulatory authority to determine which foundation type a lessee should select prior to any environmental review. This is also duplicative of BOEM regulations at 30 CFR 585.621 (e) which requires that an applicant demonstrate that the COP uses the best available and safest technology. Best available and safest technology is defined in 30 CFR 585.113 as the "best available and safest technologies that BOEM determines to be economically feasible wherever failure of equipment would have a significant effect on safety health or the environment." This measure therefore duplicates the existing regulatory requirement without the regulatory safeguard of economic feasibility and without needing to demonstrate that failure of equipment would have a significant effect on safety health or the environment. In addition this measure is duplicative of the alternatives development process in which the technical and economic feasibility of alternatives are measured using the criteria established in the "Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operations Plans pursuant to the National Environmental Policy Act". This measure serves to circumvent the process established to identify alternatives and creates a separate process without a public process. BOEM should eliminate this measure and should instead rely on its established processes for alternatives identification and	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-6 is being analyzed as an RP within the PEIS rather than an AMMM measure.

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	environmental review. If BOEM wishes to create new guidance for COP development it would need to go through a public process to revise current COP guidance.	
BOEM-2024-0001-0450-0067	Measure ID and Name: MUL-6: Low noise foundations Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "BOEM encourages the use of low noise practices in foundation installation. The use of non-pile-driving foundation types should be considered first. If not practicable then the use of the best available quieting technology should be applied to reach the received sound level limit (MUL-22).[Underline: Lessees who choose not to use quiet foundation types for any project turbines must submit a report to BOEM providing a detailed rationale for this choice including a description of any physical engineering environmental economic or supply chain barriers to using quiet foundation types within the project area. Such report excluding any proprietary material must be made publicly available."]Notes: We support measure MUL-6 which encourages the use of non-pile-driving foundation types. We recommend that BOEM add a requirement that lessees who do not use any quiet foundations for project turbines (i.e. those who use pile driving for all project turbines) submit a report providing a rationale. This reporting requirement will encourage lessees to fully consider use of quiet foundations and will provide BOEM and the public with information about any obstacles to use of quiet foundations.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-6 is being analyzed as an RP within the PEIS rather than an AMMM measure. Foundations proposed are project specific and will be analyzed in COP-specific NEPA analysis. This RP has been updated to include submission of a report providing rationale for why non-pile-driving foundations are not possible, if non-pile-driving foundations are not used.
BOEM-2024-0001-0450-0022	B. MUL-6 Low Noise Foundations; MUL-22 Received Sound Level Limit (RSLL); MUL-29 Sound Field Verification (SFV) Process Plan and Reporting 1. Mitigation of Noise from Impact Pile Driving BOEM proposes to establish reasonable limits to the noise produced by turbine installation. Developers are directed to consider using alternative foundation types such as suction buckets and gravity-based foundations; and where such foundations are not practicable to employ "best available quieting technology" sufficient to achieve a sound level limit set forth by the agency. [Footnote 100: Draft PEIS at G-19 (MUL-6).] Those limits are progressive: voluntary from May 2025 mandatory from May 2026 and requiring continued improvement such that from May 2030 sound levels are not to	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-6 is being analyzed as an RP within the PEIS rather than an AMMM measure. MUL-22 and

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	exceed criteria resulting in permanent hearing loss at distances beyond 750 meters from the foundation. [Footnote 101: See Draft PEIS at G-21 to G-22 (MUL-22).][Bold: Our organizations strongly support BOEM's approach to mitigating noise from turbine installation. Indeed we believe its proposed approach is absolutely essential to meeting the goals set forth in the agency's joint North Atlantic Right Whale and Offshore Wind Strategy[Footnote 102:See BOEM and NOAA Fisheries North Atlantic Right Whale and Offshore Wind Strategy at 44 (2023).] as well as the broader commitment of this administration to sustainable offshore wind. We take its inclusion in the final PEIS as a litmus test of that commitment.]As BOEM knows noise from impact piling constitutes the highest-amplitude noise produced during wind farm development. Without sufficient mitigation piling can cause auditory injury in cetaceans particularly in those exposed over the course of a single installation at distances of several kilometers (see Draft PEIS at 3.5.6-62 to 3.5.6-63); and can affect important marine mammal behaviors over much wider areas of ocean. [Footnote 103:See e.g. J.F. Borsani C.W. Clark B. Nani and M. Scarpiniti Fin whales avoid loud rhythmic low-frequency sounds in the Ligurian Sea Bioacoustics 17: 161-63 (2008); J. Tougaard J. Carstensen J. Teilmann H. Skov and P. Rasmussen Pile driving zone of responsiveness extends beyond 20 km for harbor porpoises (Phocoena phocoena (L.)) Journal of the Acoustical Society of America 126(1): 1-14 (2009).] These risks are of particular concern for North Atlantic right whales which are increasingly found south of New England outside the winter season. [Footnote 104: See e.g. G.E. Davis et al. Long-term passive acoustic recordings track the changing distribution of North Atlantic right whales (Eubalaena glacialis) from 2004 to 2014 Scientific Reports 7: 13460 (2017); D.P. Salisbury C.W. Clark and A.N. Rice Right whale occurrence in the coastal waters of Virginia U.S.A.: Endangered species presence in a rapidly developing energy market Marine Mammal Science 32(2): 508-19 (2016).] They are also of concern for a number of other vulnerable baleen whale populations that are experiencing significant habitat displacement due to climate change or perhaps relatedly are undergoing an unusual mortality event. [Footnote 105: G.E. Davis et al. Exploring movement patterns and changing distributions of baleen whales in	MUL-29 have been revised for clarification in the PEIS. After further consideration, MUL-38 was deleted from the PEIS.

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	the western North Atlantic using a decade of passive acoustic data Global Change Biology 26: 4812-40 (2020); NMFS "2016-2024 Humpback Whale Unusual Mortality Event along the Atlantic Coast" available at fisheries.noaa.gov/national/marine-life-distress (accessed Feb. 2024).]Noise abatement is perhaps the single most effective means of addressing these risks. In the German North Sea the combination of near-pile and far-pile abatement systems can reduce broadband sound energy levels by over 20 dB at least in water depths up to 40 meters. [Footnote 106: M.A. Bellman A. May T. Wendt S. Gerlach P. Remmers and J. Brinkmann Underwater noise during percussive pile driving: Influencing factors on pile-driving noise and technical possibilities to comply with noise mitigation values at 106 107 (2020).] That degree of reduction makes a substantial difference in take numbers. One 2015 study which applied NMFS' then-current take thresholds in a simulation of marine mammal exposures concluded that a monitoring-based mitigation system using multiple visual observers would be less effective than a minimal 3-dB noise abatement system at reducing acoustic injury from seismic airgun surveys. [Footnote 107: R. Leaper S. Calderan and J. Cooke A simulation framework to evaluate the efficiency of using visual observers to reduce the risk of injury from loud sound sources Aquatic Mammals 41(4): 375-87 (2015).] And of course systems based on visual observations cannot mitigate exposures beyond a short distance from the foundation across the much larger expanse of ocean where the vast majority of takes occur. Until now BOEM has required lessees to achieve pre-defined targets for broadband noise reduction typically 10 dB or greater. That approach however does not account for the trend towards larger and larger piles which require greater strike energy to drive and correlate with higher received sound levels. [Footnote 108: Bellmann Underwater noise during percussive pile driving supra at 57.] These increases begin to taper off as turbine diameters expand beyond 6 and 7 m [Footnote 109: See id. at 56 (fig. 13).] but still should be addressed with a consistent standard if BOEM aims to reduce the distances over which low- frequency cetaceans can experience auditory injury. Moreover the agency's current approach where reduction targets are occasionally ratcheted up as technology	

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	improves provides little predictability for lessees who do not know what standards may be required in future COPs. Just as importantly it has little ability to drive innovation since noise abatement companies do not know what future specifications lessees may be required to meet. Nor is it sufficient for BOEM to rely on a generalized "best available technology" standard. Technology development has been driven since 2010 by the German standard for impact-piling noise; and while that standard has ably demonstrated how noise limits can spur significant innovation in the field it was originally focused on reducing auditory impacts on high-frequency cetaceans particularly harbor porpoises and has lagged in its reduction of low-frequency noise. This lag can readily be found in spectral analyses of noise abatement systems. For example in the spectrograph that Bellmann et al. (2020) provide of noise from unmitigated and unmitigated monopiles in the German EEZ substantially less noise reduction is achieved below 1 kHz; a similar outcome can be seen in specific noise abatement systems used in the North Sea. [Footnote 110: See id. at 109 111 (figs. 32 and 33).] Relying on a generalized best available technology standard will not result in improvements in the frequencies of greatest concern for North Atlantic right whales and other baleen whales. BOEM's noise limits are based both on its synthesis of acoustic modeling from various COPs and on the European experience with noise reduction. [Footnote 111:See BOEM BOEM proposed quieting performance target (2022) (paper presented at Offshore Wind Noise Reduction Workshop convened Dec. 2022 by the U.S. Department of Energy).] Based on that analysis the majority of assessed projects would achieve the May 2026 limit and some would already achieve the furthest limit which will not apply until May 2030. The agency's standards are appropriate and achievable. That said BOEM proposes to provide lessees with the opportunity for an exemption to be considered on a case-by-case basis where "meeting the [limit] is not technically and commercially practicable." [Footnote 112:Draft PEIS at G-22 (MUL-22). See also Draft PEIS at G-29 to G-30 (MUL-38) (articulating a similar case-by-case consideration for noise mitigation plans that do not meet noise reduction targets).] BOEM's proposed approach is essential appropriate and entirely in line with the	

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	general movement in ocean noise policy towards noise abatement. [Footnote 113: On the last point see e.g. J.A. Lee and B.L. Southall Practical approaches for reducing ocean noise associated with offshore renewable energy development (2022) (report of multi-stakeholder workshop convened by the Global Alliance for Managing Ocean Noise demonstrating inter alia strong support for noise minimization as the most promising mitigation approach).] We strongly support BOEM's use of sound level limits as an integral part of its mitigation strategy. Improved Sound Field Verification Process for Impact Pile Driving Noise generated by impact pile driving of turbine foundations is one of the major concerns for marine mammals and other marine life during the construction of offshore wind. A rigorous sound field verification (SFV) process is required to accurately measure the level of noise produced during impact pile driving the effectiveness of any noise abatement systems applied and adherence to the newly proposed BOEM received sound level limit (RSLL) requirements (MUL-22) or other required regulatory noise thresholds. We are highly supportive of BOEM's improved sound field verification process as proposed in the Draft PEIS (MUL-29) as well as the final North Atlantic Right Whale and Offshore Wind Strategy. [Footnote 114: BOEM and NOAA Fisheries. North Atlantic Right Whale and Offshore Wind Strategy (Jan. 2024) at 45-46.] In brief BOEM is proposing to conduct "Thorough SFV Monitoring" (defined as recording along a minimum of two radials with at least one radial containing three or more recorders) on the first three foundations of a project as well as when a foundation is expected to differ substantially in key parameters that may significantly affect the noise output during impact piling. Thorough SFV Monitoring is intended to prove adherence to authorized ranges to regulatory thresholds (specified by the RSLL or other approvals documents) and will also inform the optimization of any noise abatement systems or other noise reduction technology deployed. An "Abbreviated SFV Check" must then be conducted at all other piles at 750 meters from the pile driving site to monitor for any deviation in adherence to the required regulatory noise thresholds (e.g. due to a reduction in noise abatement system effectiveness). If the Abbreviated SFV Check detects such deviation Thorough SFV Monitoring must again be	

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	conducted until SFVs from three consecutive foundations demonstrate adherence to authorized levels following a foundation that exceeds said limit. An Abbreviated SFV Check will be extremely beneficial in providing regulatory oversight and also key learnings about the design and effectiveness of noise abatement systems for piles driven in U.S. waters (e.g. the effect of local oceanographic conditions on system effectiveness or the influence of larger diameter piles and higher energy impact hammers).We recognize that additional SFV monitoring requirements may require more real-time decision making on the part of developers technicians and agency staff during the construction period. In order to avoid unnecessary delays that may negatively impact a project's construction schedule we recommend BOEM work with NOAA and BSEE to develop clear chains of communication and decision trees that clearly specify an efficient process and remedy in the case that SFV monitoring indicates a deviation from the specified regulatory thresholds. We recommend BOEM detail this process in the Final PEIS. Timely reporting of SFV monitoring is also a top priority. BOEM is proposing to require the submission of SFV Monitoring Reports to BOEM BSEE (TIMS) NMFS and USACE (when applicable) within 48 hours of completion of foundation installation. Abbreviated SFV Check reports may be submitted in weekly batch reports assuming measurements are in compliance with all applicable regulatory thresholds. It is unstated in the Draft PEIS the reporting timeline when an Abbreviated SFV Check indicates a foundation installation is out of compliance with regulatory requirements. We recommend BOEM require immediate reporting in that instance. When determining a timeline for report submission we also recommend that BOEM make certain that the proposed reporting requirements are timely enough to prevent a subsequent foundation from being installed with noise levels that may be out of regulatory compliance. For example several developers are proposing to drive multiple piles per day either consecutively or simultaneously. In this case a 48-hour reporting period may be insufficient. In addition to the agencies listed above BOEM should also require submission of the SFV Monitoring Reports to the Marine Mammal Commission as the independent agency tasked with ensuring compliance to the MMPA.	

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	Transparency is key to shoring up public trust in the offshore wind industry as well as related agency decision making. We strongly recommend that all SFV Monitoring Reports be made publicly available within one month of their submission to BOEM and other relevant agencies. For proposed changes to measure MUL-29 see Attachment 2 table 1.	
BOEM-2024-0001-0439-0061	Measure ID: MUL-7 Measure Name: Vessel noise reduction guidelines Description: The Lessee should to the extent reasonable and practicable follow the most current International Maritime Organization's (IMO) Guidelines for the reduction of underwater radiated noise including propulsion noise machinery noise and dynamic positioning systems of any vessel associated with the project. Previously Applied as a COP T&C: Category: V T/E D BACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. As Alternative C assumes adoption of all AMMMs as terms and conditions of plan approval for the purposes of the analysis these AMMMs are not in fact voluntary. Adoption of voluntary AMMMs through terms and conditions undermines the very voluntary nature of those measures. Implementation of a vessel sound emissions reduction measures appears both unnecessary and impractical. The relative amount of vessel sound associated with offshore wind is minimal. Based on estimates from MarineTraffic.com offshore wind vessels account for less than 2% of all offshore vessel traffic. Even though vessel traffic would increase during construction and operations activities it still represents a very small percentage of overall vessel traffic. Given that offshore wind accounts for such a small percentage of marine traffic implementation of the sound emissions reductions will provide no measurable protection to species and will instead add to the burden of the offshore wind industry and ratepayers. In addition this would not be feasible for the projects currently in the permitting pipeline (including the NY Bight lessees) as they are already making procurement decisions and entering contracts with vessels and because of the limited vessel availability due to the nascent U.S. supply chain and Jones Act requirements. This measure is also attempting to implement guidelines that are USCG's responsibility. The attempt to meet	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-7 is being analyzed as an RP within the PEIS rather than an AMMM measure and has been updated for clarification.

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	national and international standards (IMO standards) is outside BOEM's jurisdiction and is not appropriate for BOEM to use NEPA mitigations to enforce compliance with those standards. Instead BOEM should coordinate with USCG NOAA and related agencies to ensure that its ROD is consistent with applicable environmental laws and consultations.	
BOEM-2024-0001-0450-0068	Measure ID and Name: MUL-7: [Strikethrough: Vessel noise reduction guidelines] [Underline: Underwater vessel noise management plans] Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "The Lessee [Strikethrough: should to the extent reasonable and practicable] [Underline: must] [Strikethrough: follow the most current] [Underline: create an underwater vessel noise management plan for each vessel used in construction operations and maintenance. The management plan(s) should to the extent practicable include a description of underwater vessel noise targets identified for each vessel (this may include unique targets when they become available for vessels operating dynamic positioning systems) how such targets will be achieved and the periodic monitoring that will ensure continued achievement of the target. (Where lessees are chartering vessels the underwater vessel noise management plans should describe the lessees' selection of quiet vessels and/or the operational measures chartered vessels will implement to minimize vessel noise both during transit and operations.) Lessees are encouraged to consult the] International Maritime Organization's (IMO) [Underline: Revised] Guidelines for the reduction of underwater radiated noise [Underline: from shipping to address adverse impacts on marine life MEPC.1/Circ.833 (2023)]. [Strikethrough: including propulsion noise machinery noise and dynamic positioning systems of any vessel associated with the project]. [Underline: BOEM and BSEE will review the plan for sufficiency and acceptability. Any outstanding comments must be addressed by the Lessee before the plan is considered final. The plan may be submitted as part of the Noise mitigation plan (MUL-38)."]Anticipated enforcing agency: [Strikethrough: Voluntary] [Underline: BOEM and BSEE] Notes: We recommend that BOEM strengthen MUL-7 by requiring lessees to create an underwater	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-7 is being analyzed as an RP within the PEIS rather than an AMMM measure and has been updated for clarification. If this is analyzed at the project stage, additional details can be considered. Upon further consideration, MUL-38 has been removed.

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	vessel noise management plan for each vessel used in construction operations and maintenance.	
BOEM-2024-0001-0446-0002	Avoidance of Underwater Noise From Impact Pile-Driving Should be a Prioritized AMMMBOEM affirms that its "approach to mitigation is to first avoid potential impacts and then to mitigate unavoidable impacts such that the severity or duration of those impacts is minimized to the extent practicable." See Vol. I Sec. 1.9 at 1-11. But the AMMM measures in the dPEIS do not prioritize the avoidance step of the mitigation hierarchy relative to the generation of noise associated with vibratory or impact pile-driving. The mitigation hierarchy provides a framework for offshore wind to deliver biodiversity benefits and climate change mitigation. The hierarchy sets avoidance as the first and most important step to project development. Avoiding impacts to priority habitat features and species is best achieved in the wind energy area selection phase and then at the project-level in the initial design phase (foundation technology selection micro-siting project layout construction scheduling). It is paramount to sequentially and iteratively apply the established mitigation hierarchy throughout the life of a project with the goal of achieving No Net Loss (NNL) for priority species and habitat at the project-level. Although the dPEIS addresses underwater noise and acoustic impacts it does this primarily by recommending measures to "reduce impacts from noise" and to "reduce impacts from pile-driving on mobile species." See Vol. II Sec. J.3.3.1 at J-10. The dPEIS includes a lengthy list of AMMM measures (previously required in COPs) that are designed to "reduce" not to "avoid" impacts such as: soft-start techniques sound attenuation (double bubble curtains) and near field attenuation devices. See Vol. I Sec. 3.5.5.5.1 at 3.5.5-49. For example the acoustic assessment plan found in Appendix J describes the physics of underwater sound and assesses the propagation of sound relative to sound source. It classifies the noise from sources such as vessels (including operations and maintenance general transit and acoustic positioning) geophysical and geotechnical surveying drilling site preparation trenching and unexploded ordinance detonations. Yet the only sound source classified for construction and installation methods is for impact and vibratory pile-driving. See Vol. II Appendix	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-6 is being analyzed as an RP within the PEIS rather than an AMMM measure and has been updated for clarification and to include a recommendation for lessees to provide justification as to why they did not select low-noise foundations, if applicable. MUL-22 has been revised for clarification in the PEIS and, upon further consideration, MUL-38 (noise mitigation plan) has been removed.

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	J at J-9. No other construction and installation foundation technology was considered or assessed. AMMM measure MUL-28 requires developers to create an underwater noise mitigation plan with the purpose of "assessing and minimizing potential impactful noise to the maximum extent practicable." Additional discussion of the noise-related AMMMs and how they may reduce (not avoid) noise impacts can be found in Vol. II Appendix J at 3-5.7-49.The dPEIS lists nearly fifty AMMM measures that are designed for the protection of marine mammals and other wildlife from vessel strikes entanglement and noise that may be associated with offshore wind development. Nearly half of these proposed AMMM measures are intended as noise mitigation for marine mammals. The association of such a significant number of AMMM measures with noise mitigation begs the question: is the avoidance of acoustic impacts associated with pile-driving properly prioritized? Although in Appendix G BOEM does "encourage the use of low noise foundations" and states that "the use of non-pile driving foundation types should be considered first" these are listed as voluntary AMMM measures. See MUL-6 at G-19. BOEM's inclusion of a physical distance limit for injurious sound to baleen whales clearly establishes BOEM's interest in reducing the sound fields generated during impact pile-driving over time. See Appendix G J MUL-22 re: the Received Sound Level Limit (RSLL). TNC has previously commented to BOEM that the initial goal of monitoring sound propagation is to establish pile- driving noise thresholds aimed at avoiding both physiological and behavioral impacts to marine species especially from cumulative noise exposure resulting from temporal or spatial project construction overlaps. The establishment and inclusion of the RSSL in the dPEIS is meaningful progress. Ultimately this data will be used to steer developers toward choosing a foundation type that avoids these physiological and behavioral impacts altogether at some future point in time but this is not the only way to elevate quiet foundations as the best first choice. The AMMM measures in Appendix G should demonstrate how developers can design their projects to avoid impacts and the costly and time-consuming mitigation measures that come with not avoiding those impacts. Avoiding exposure of marine wildlife to pile-driving noise unequivocally represents the best practice. Pile-driving	

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	noise is anticipated to have impacts on all taxa of marine life yet by focusing on minimization and mitigation as opposed to avoidance the emphasis is largely on North Atlantic Right Whales and to a lesser extent large whales whereas avoidance would benefit all marine life including but not limited to protected species. As written the dPEIS essentially classifies the avoidance of construction and installation noise associated with impact pile-driving as a voluntary AMMM measure.	
BOEM-2024-0001-0446-0003	[Bold Underline: The dPEIS Should Incentivize Avoidance of Underwater Noise From Impact and Vibratory Pile-Driving by Clearly Outlining Anticipated Mitigation Requirements Associated with the Different Foundation Technologies.] BOEM is soliciting feedback on AMMM measures related to measuring monitoring and reducing noise and its impacts on marine life. Specifically BOEM is seeking information on techniques and procedures that may be helpful to meet any marine noise reduction targets or to reduce the impact of any noise introduced into the marine environment; and what criteria BOEM should consider in determining whether a specific project could be exempted from a noise reduction target for the NY Bight and future projects. See Vol. II Appendix I Sec. I.4 at I-23.Clear descriptions of the available foundation types preferred depths and geologic conditions and the potential associated impacts and corresponding mitigation for each respective foundation technology will inform and inspire not only developer decision-making relative to technology determinations but could also act as criteria of a sort for exempting a specific project from a noise reduction target and related mitigation. BOEM's 2021 white paper entitled Comparison of Environmental Effects from Different Offshore Wind Turbine Foundations[Footnote 1: Horwath (ICF) et al. Comparison of Environmental Effects from Different Offshore Wind Turbine Foundations OCS Study BOEM 2021-053. 2021 This white paper was intended to be incorporated by reference in future NEPA documents but is not mentioned in the dPEIS.] began this foundation- type analysis and included a table (Table ES-1) that listed preferred depths and site conditions needed for various foundation types. [Footnote 2: Preferred depths and site conditions should be updated as technologies evolve and also informed by developer expertise	Thank you for your comment. A description of non-pile-driving methods is provided in Appendix J, Section J.3.7, of the Final PEIS, which encourages developers to use low-noise foundation types and apply noise-abatement systems where possible. For this PEIS, specific water depths and site conditions are unknown, so all possible foundation types are included in the RPDE.

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	relative to applied technologies.] This table could be expanded to more clearly define anticipated impacts and associated mitigation per foundation type. As BOEM addresses this missing data point for the final PEIS it would be incredibly helpful for BOEM to describe the process it uses for determining which mitigation measures align with which foundation technologies. TNC strongly recommends that the relevant federal agencies including NOAA and NMFS work together to achieve this outcome for the final PEIS by coordinating and agreeing on corresponding mitigation requirements for different foundation technologies.	
BOEM-2024-0001-0450-0025	E. MUL-41 Proposed New Mitigation Measure for Quieter Vessels Vessel traffic has the potential to contribute significantly to excess continuous noise levels in offshore lease areas perhaps most especially during construction. Bellmann et al (2020) reported that some offshore wind construction projects in Germany had as many as 20 vessels at a time in operation within a radius of a few kilometers laying cable erecting turbines conducting noise abatement etc. [Footnote 124: Bellmann Underwater noise during percussive pile driving supra at 111.] Noise from these vessels can include not only radiated vessel noise but also noise generated from the use of dynamic positioning systems or underwater communication signals such as echo sounders or sonars. [Footnote 125: Id. at 115.] It is well-established that vessel noise can contribute to changes in behavior and stress levels of marine animals and can cause auditory masking that further disrupts the use and reception of natural sounds. [Footnote 126: Erbe C. S.A. Marley R.P. Schoeman J.N. Smith L.E. Trigg and C.B. Embling. 2019. The effects of ship noise on marine mammals A Review. Front. Mar.Sci. Vol 6. https://doi.org/10.3389/fmars.2019.00606.] Indeed vessel activity and pre-piling installation activities have been shown to increase local underwater broadband noise to levels that displace and disturb marine mammals. [Footnote 127:Benhemma-Le Gall A. P. Thompson N. Merchant and I. Graham. 2023. Vessel noise prior to pile driving at offshore windfarm sites deters harbour porpoises from potential injury zones. Environmental Impact Assessment Review 103: 107271.] Unfortunately the mitigation measures BOEM proposes to address vessel noise fail to directly mitigate vessel noise and	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MUL-7 is being analyzed as an RP within the PEIS rather than an AMMM measure and has been updated for clarification and to encourage use of quieter ships as outlined by the IMO guidelines.

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	furthermore are voluntary. With significant global attention focused on the need to reduce underwater radiated noise from vessels there have been important advances both in vessel design and vessel underwater noise management planning that BOEM should incorporate into its proposed mitigation measures. Many of the vessels necessary to support the construction operations maintenance and decommissioning of offshore wind are not yet built (largely due to requirements imposed by the Jones Act). [Footnote 128: U.S. Congressional Research Service. Vessel Construction for Offshore Wind Power Generation. In Focus September 12 2023. By John Frittelli. Accessed online: February 12 2024] This creates a unique opportunity for BOEM to create conditions that promote the design (and retrofitting) of quieter vessels. Presently there are seven classification societies globally that offer "Quiet Ship Notations" to vessels that meet criteria that minimize underwater radiated noise. [Footnote 129: The ship classification societies presently offering quiet ship notations include: the American Bureau of Shipping (Underwater noise notation); Bureau Veritas (Underwater Radiated Noise notation); China Classification Society (Underwater noise notation); Det Norske Veritas (SILENT Environmental (E) notation); Korean Register (Underwater Radiated Noise notation); Lloyd's Register (Underwater Radiated Noise (UWN-L) notation); Registro Italiano Navale (DOLPHIN notation).] Furthermore designers now have resources available that identify various quieting technologies and approaches that can be used to achieve such notations. [Footnote 130: Ship energy efficiency and underwater radiated noise. Report 545-000-01 Rev 3. Prepared for Transport Canada by Vard Marine Inc. October 20 2023.] We note that BOEM has developed mitigation measures that encourage low- or zero-emission vessel technologies and fuels (see AQ-2 and AQ-e) if feasible. Likewise we propose a new mitigation measure that encourages adoption of quiet ship notations for all vessels if feasible and requires concurrence by BOEM and BSEE of why adoption of such notations is infeasible. (See Attachment 2 table 2 for new proposed measure MUL-41). Our proposed measure would create the opportunity for BOEM where feasible to ensure that vessels are designed and built to operate quietly both driving innovation	

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	spurring the building of quieter vessels and more effectively mitigating underwater vessel noise impacts.	
BOEM-2024-0001-0224-0004	Noise Pollution: The PEIS acknowledges the consideration of measures to mitigate noise impact on marine life. However the effectiveness and long-term consequences of these measures need further examination particularly regarding potential harm to marine species.	Thank you for your comment.
BOEM-2024-0001-0331-0025	The academic paper in PEIS Appendix J Introduction to Sound and Acoustic Assessment bears no resemblance to the six projects in the PEIS. The paper uses two theoretical sites only 60 turbines each for a total of 120. This is a tenth of the number of turbines planned for the Bight which is 1103. The turbines in the study are only 6 MW compared to the huge 1300 ft high turbines planned for the NY Bight. This study used in the PEIS has no relevance to the NY Bight projects. The pile driving noise level is for driving a roughly 20-foot diameter pile which is small by present and future standards. The 13-15 MW turbines use piles that are around 40 ft in diameter. A 20 MW turbine may be as large as a 60 foot diameter. This lack of rigor is an example of BOEM's rushed and reckless push for offshore wind. Any mitigation measures that are suggested for noise in the PEIS if responding to the irrelevant study are unacceptable.	Thank you for your comment. The framework was used as a theoretical basis for understanding impacts of construction timing and mitigations.
BOEM-2024-0001-0450-0038	1) Use quiet foundations in construction. a) Whenever possible project proponents should use gravity-based and suction bucket foundations which eliminate the need for pile driving and thereby significantly reduce underwater noise pollution and the risk of noise impacts to marine mammals and sea turtles.	Thank you for your comment. MUL-6 has been updated to include new language about quiet foundations.
BOEM-2024-0001-0450-0039	2) Prohibit pile driving during times of highest risk to North Atlantic right whales: a) Pile driving must not occur during periods of highest risk to North Atlantic right whales. Time periods of highest risk include but are not limited to during foraging and migration and times when mother-calf pairs pregnant females surface active groups (indicative of breeding or social behavior) or aggregations of three or more whales (indicative of feeding or social behavior) are or are expected to be present. Time periods must be defined based on the best available scientific information.	Thank you for your comment. Time area closures (times of year when NARW are expected) are applied and BOEM continues to require and monitor development of real-time monitoring systems (PAM and PSOs are also real-time monitoring).

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	b) If a near real-time monitoring system and mitigation protocol for North Atlantic right whales and other large whale species is developed and scientifically validated the system and protocol may be used to dynamically manage the timing of pile driving and other construction activities to ensure those activities are undertaken during times of lowest risk for all relevant large whale species. The development of such a protocol is particularly important where foraging aggregations of other large whale species are observed coincident with the times that pile driving would most likely be undertaken based on times of lower relative risk to North Atlantic right whales.	
BOEM-2024-0001-0450-0040	3) Restrict pile-driving activity at night and during periods of low visibility: a) Pile driving must not be initiated within 1.5 hours of civil sunset or in times of low visibility when the visual clearance zone and exclusion zone (defined in Section III(5) below) cannot be visually monitored as determined by the lead PSO on duty. b) Pile driving may continue after dark only if the activity commenced during daylight hours and must proceed for human safety or installation feasibility reasons [Footnote 24: Throughout this document "installation feasibility" refers to ensuring that the pile installation event results in a usable foundation for the wind turbine (i.e. foundation installed to the target penetration depth without refusal and with a horizontal foundation/tower interface flange). In the event that pile driving has already started and nightfall occurs the lead engineer on duty will make a determination through the following evaluation: 1) Use the site-specific soil data on the pile location and the real-time hammer log information to judge whether a stoppage would risk causing piling refusal at re-start of piling; and 2) Check that the pile penetration is deep enough to secure pile stability in the interim situation taking into account weather statistics for the relevant season and the current weather forecast. Such determinations by the lead engineer (or their alternate) on duty will be made for each pile location as the installation progresses and not for the site as a whole. This information will be included in the reporting for the project.] and if required night-time monitoring protocols are followed (see Section III(8)).	Thank you for your comment. AMMM measure language (MMST-1) has been updated to align with the latest T&Cs.

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BOEM-2024-0001-0450-0041	4) Sound fields generated during impact pile driving must not exceed NOAA Fisheries' Level A permanent threshold shift (PTS) limits for low frequency cetaceans (LFC) by the specified date and at the distances below. Every attempt must be made to reach the Received Sound Level Limit (RSLL) at 100% of foundations. a) Voluntary: i) May 1 2025: After the first three foundations no exceedance of RSLL beyond 4921 feet (ft) (1500 m) from the foundation for 90% of remaining piles. b) Required: i) May 1 2026: After the first three foundations no exceedance of RSLL beyond 4921 ft (1500 m) from the foundation for 90% of remaining piles. ii) May 1 2028: After the first three foundations no exceedance of RSLL beyond 3280 ft (1000 m) from the foundation for 90% of remaining piles. iii) May 1 2030: After the first three foundations no exceedance of RSLL beyond 2460 ft (750 m) from the foundation for 90% of remaining piles. c) On a case-by-case basis BOEM may consider an exception to the RSLL if the lessee provides sufficient written justification as determined by BOEM of why meeting the RSLL is not technically and commercially practicable. In these cases compensatory mitigation may be considered such as operator contributions to research and monitoring that reduce noise or contribute To a better understanding of noise reduction. d) Field measurements must be conducted as described in section 3 ("Offshore Wind Pile Driving Sound Field Measurement Recommendations") of the Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans (BOEM 2023). As described in BOEM (2023) the "Thorough SFV Monitoring" procedure should be conducted for the first three foundations of a project and when a foundation is to be installed with substantially different foundation construction and environmental parameters. An "Abbreviated SFV Check" should be	Thank you for your comment, which was considered in the updated AMMM measure language (MUL-22) in the Final PEIS.

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	performed on any foundation installation for which "Thorough SFV Monitoring" is not planned. e) Sound source validation reports of field measurements must be evaluated by both BOEM and NOAA Fisheries prior to additional piles being installed. Reports must be made publicly available within one month after their submission to BOEM and other relevant agencies.	
BOEM-2024-0001-0450-0042	5) Require the following clearance zone distances prior to pile driving and exclusion zone distances during pile driving: a) For North Atlantic right whales: i) A visual clearance zone and exclusion zone must extend at minimum 5000 m in all directions from the location of the driven pile. ii) An acoustic clearance zone must extend at minimum 10000 m in all directions from the location of the driven pile. iii) An acoustic exclusion zone must extend at minimum 2000 m in all directions from the location of the driven pile. iv) If a surface active group (indicative of breeding or social behavior) or an aggregation of three or more whales (indicative of feeding or social behavior) is detected via regional or opportunistic detection methods (e.g. regional aerial surveys or WhaleAlert) within 20 kilometers of a pile installation site then the start of pile driving should be delayed until the surface-active group or aggregation is no longer reported within that distance. b) If a large whale is detected visually or acoustically within the clearance or exclusion zones defined in Section III(5)(a) for North Atlantic right whales but the species cannot be identified it must be assumed to be a North Atlantic right whale. c) For all other marine mammals: i) Clearance and exclusion zone distances for other marine mammal species must be designed in a manner that eliminates Level A take and minimizes behavioral harassment to the fullest extent practicable. d) For sea turtles: i) A visual clearance zone and exclusion zone must extend at minimum 500 m in all directions from the location of the driven pile.	Thank you for your comment. These exclusion zone distances are based on acoustic modeling and not fixed for every project. MM-2 encourages implementation of a near-real-time PAM system for the detection of baleen whales in the NY Bight during offshore wind development activities.

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BOEM-2024-0001-0450-0043	6) Require a 24-hour pre-construction passive acoustic monitoring period for North Atlantic right whales prior to commencing pile-driving activities: a) Monitoring for North Atlantic right whales must be undertaken using near real-time PAM assuming a detection range of at least 10000 m for 24 hours prior to commencing pile- driving activities. PAM must be undertaken at the location of the pile-driving site in order to detect whales within a 10000 m radius. b If a North Atlantic right whale vocalization is detected the 24-hour monitoring period must be recommenced. Pile-driving activities must not commence until a 24-hour monitoring period has passed without any detection of North Atlantic right whale vocalizations.	Thank you for your comment. Pre-construction monitoring already includes a requirement for acoustic monitoring. MMST-4 was updated to specify 24 hours, which was previously established as a COP T&C. BOEM will not be adding a requirement for waiting 24 hours after every detection of NARW; instead, foundation pile-driving may only commence when clearance zones are clear of marine mammals for at least 30 minutes immediately prior to foundation pile-driving, as determined by the lead PSO. Any large whale sighting by a PSO or detected by a PAM operator that cannot be identified as a non-NARW must be treated as if it were a NARW.
BOEM-2024-0001-0450-0044	7) Delay initiation or require shutdown of pile driving if a marine mammal or sea turtle is detected visually or if a North Atlantic right whale is detected acoustically in clearance and exclusion zones (as defined in Section III(5)): a) Pile driving must not be initiated when monitoring methods defined in Section III(8) result in either an acoustic detection within the acoustic clearance zone of one or more North Atlantic right whales or a visual detection within the visual clearance zone of one or more marine mammals or sea turtles. i) If localization cannot be achieved by acoustic detection as described in Section III(8)(a)(i) below pile driving must not be initiated upon detection of a North Atlantic right whale call regardless of distance from the sound source. b) Pile driving must not be initiated or if already underway must be shut down unless continued pile-driving activities are necessary for reasons of human safety or installation feasibility when monitoring methods defined in Section III(8) result in acoustic detection within the acoustic exclusion zone of one or more North Atlantic right whales or a visual detection within the visual exclusion zone of one or more marine mammals or sea turtles. i) If localization cannot be achieved by acoustic detection as described in Section III(8)(a)(i) below pile driving must not be initiated or if already underway must be shut down upon detection of a North Atlantic right whale call regardless of distance from the sound source.	Thank you for your comment. Recommendations provided in the comment are already covered under an existing AMMM measure (MMST-4).

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	c) Pile driving must be shut down unless continued pile-driving activities are necessary for reasons of human safety or installation feasibility if a North Atlantic right whale is visually detected by PSOs at any distance from the pile. d) Once halted pile driving may resume only after using the methods set forth in Section III(8) and the lead PSO confirms no marine mammals or sea turtles have been detected within the relevant acoustic and visual clearance zones.	
BOEM-2024-0001-0450-0045	8) Require robust near real-time monitoring protocols during pre-clearance and when pile- driving activity is underway: a) Monitoring of the acoustic clearance and exclusion zones must be undertaken using near real-time PAM assuming a detection range of at least 10000 m and must be undertaken from a vessel other than the pile-driving vessel or from a stationary unit to avoid the hydrophone being masked by the pile-driving vessel or development-related noise. i) The PAM system should be set up so that it is capable of localizing the position of vocalizing whales. A plan detailing any proposed localization system and analysis methods should be submitted to BOEM and other relevant permitting agencies in advance of deployment. The system should meet the following criteria:[Footnote 25: See also recommendations in Van Parijs SM et al. 2021.](1) Stationary systems must have a minimum of three hydrophones (accuracy can be greatly improved by using four hydrophones) and mobile systems (e.g. towed arrays) must have a minimum of two hydrophones.(2) Simulations should be conducted prior to selecting the number and location of receivers to maximize accuracy (i.e. reduce confidence intervals) in the final configuration.[Footnote 26: There are several mathematical methods to improve the accuracy of localization estimates by reducing the confidence intervals for each parameter that should be follow. See Spiesberger J. 2022.](3) Systems should be calibrated before deployment to ensure accurate detection capability.(4) For time-of-arrival based systems synchronization of data streams from the multiple receivers is necessary for accurate calculations.(5) Irrespective of the system used careful testing and documentation of localization errors should be undertaken.	Thank you for your suggestions. BOEM has updated both MMST-4 and MMST-7, which largely cover requested components. BOEM is not requiring four PSOs at this time, but this could be considered at the project-specific phase.

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	b) During pre-clearance and when pile-driving activity is underway monitoring of the visual clearance and exclusion zones must be undertaken by vessel based PSOs stationed at the pile- driving site and on additional vessels circling the pile-driving site as needed. On each vessel there must be a minimum of four PSOs following a two-on two-off rotation each responsible for scanning no more than 180 of the horizon per pile-driving location. To effectively monitor the full exclusion zone multiple PSOs must be stationed at several vantage points at the highest level to allow each to continuously scan a section of the exclusion zone. Additional vessels must survey the clearance and exclusion zones at speeds of 10 knots or less. Ensure PSOs do not exceed two consecutive watch hours on duty at any time have a two-hour (minimum) break between watches and do not exceed a combined watch schedule of more than 12 hours in a 24-hour period. PSO schedules should be designed to minimize observer fatigue. c) Acoustic and visual monitoring must begin at least 60 minutes prior to the commencement or re-initiation of pile driving and must be conducted throughout the duration of pile-driving activity. Visual monitoring must continue until 30 minutes after cessation of pile driving. d) Infrared technology must be used to support visual monitoring during any pile-driving activities that extend into periods of darkness. e) Additional observers and monitoring technologies (e.g. infrared drones hydrophones) must be deployed as needed to ensure the ability to monitor the established clearance and exclusion zones including during periods of darkness or poor visibility.	
BOEM-2024-0001-0450-0046	9) Require mandatory reporting of marine mammals and sea turtles detected during pre-clearance when pile driving is underway and for at least 30 minutes following pile driving: a) All visual observations and acoustic detections of North Atlantic right whales must be reported to NOAA Fisheries or the United States Coast Guard as soon as possible and no later than the end of the PSO shift. We note that in some cases such as with the use of near real- time autonomous buoy systems the detections will be reported automatically on a pre-set cycle.	Thank you for your comment. Recommendations provided in the comment are mostly covered under an existing AMMM measure (MM-1). Additionally, any ESA-listed species sightings in a shutdown zone are required to be reported per MMST-10.

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	b) Observations of entangled injured or dead North Atlantic right whales and other entangled injured and dead marine mammal species and sea turtles must be immediately reported to NOAA Fisheries' Northeast Marine Mammal and Sea Turtle Stranding and Entanglement Hotline (1-866-755-6622) for states from Maine to Virginia; NOAA Fisheries' Southeast Marine Mammal Stranding Hotline (1-877-942-5343) or Southeast Sea Turtle Stranding and Salvage Network (1-844-732-8785) for states from North Carolina to Florida;[Footnote 27: NOAA Fisheries "Report a Stranded or Injured Marine Animal" https://www.fisheries.noaa.gov/report.] or the United States Coast Guard via one of several available systems (e.g. phone app radio). Methods of reporting are expected to advance and streamline in the coming years and projects should commit to supporting and participating in these efforts. c) PSO sightings data must be submitted to BOEM as directed in any relevant guidance site assessment plan (SAP) or construction and operations plan (COP) approval or other agency protocol. Sightings data and reports provided to BOEM should be made publicly available by BOEM to inform marine mammal and sea turtle science and protection.	
BOEM-2024-0001-0450-0047	1) Require the following clearance zone distances prior to construction activities and exclusion zone distances during construction activities: a) Clearance zone and exclusion zone distances for marine mammals must be designed that will eliminate Level A take and minimize behavioral harassment to the full extent practicable during the installation of gravity-based or suction bucket foundations or floating offshore wind platforms considering noise levels expected to be generated during installation. b) Clearance and exclusion zones of 100 m must be established for sea turtles.	Thank you for your comment and suggestion. If other foundation types that were not analyzed as part of the PEIS RPDE are considered at the project-specific stage, they will be analyzed at that time.
BOEM-2024-0001-0450-0048	2) Delay initiation of or require shutdown of construction activities if a marine mammal or sea turtle is detected visually or if a North Atlantic right whale is detected acoustically in clearance or exclusion zones (as defined in Section IV(1)):a) Installation of gravity-based and suction bucket foundations and floating offshore wind platforms must not be initiated when the application of monitoring methods	Thank you for your comment and suggestion. Please refer to response to comment BOEM-2024-0001-0450-0047 regarding other foundation types.

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	defined in Section IV(3) results in a visual detection of a marine mammal or sea turtle or an acoustic detection of a North Atlantic right whale within the relevant clearance zone (as defined based on noise levels expected during installation; see Section IV(1)).i) If localization as described in Section IV(3)(a)(i) below cannot be achieved by acoustic detection installation activities should not be initiated upon detection of a North Atlantic right whale call regardless of distance from sound source. b) Installation of gravity-based and suction bucket foundations and floating offshore wind platforms must be halted unless continued installation activities are necessary for reasons of human safety or installation feasibility when the application of monitoring methods defined in Section IV(3) results in a visual detection of a marine mammal or sea turtle or an acoustic detection of a North Atlantic right whale within the relevant exclusion zone (as defined based on noise levels expected during installation; see Section IV(1)).i) If localization as described in Section IV(3) below cannot be achieved by acoustic detection installation activities should not be initiated upon detection of a North Atlantic right whale call regardless of distance from sound source. c) Once halted installation may resume after use of the methods set forth in Section IV(3) and the lead PSO confirms no marine mammal or sea turtle species have been detected within the relevant clearance zones.	
BOEM-2024-0001-0450-0049	3) Require robust near real-time monitoring protocols during clearance and installation: a) Monitoring of the acoustic clearance and exclusion zones for North Atlantic right whales must be undertaken using near real-time PAM from a vessel other than the installation vessel or from a stationary unit to avoid the hydrophone being masked by installation- related noise. i) The PAM system should be set up so that it is capable of localizing the position of vocalizing whales. A plan detailing any proposed localization system and analysis methods should be submitted to BOEM and other relevant permitting agencies in advance of deployment. The system should meet the following criteria:[Footnote 28: See also recommendations in Van Parijs SM et	Thank you for your comment and suggestion. BOEM has reviewed and considered public comments on AMMM measures and revised the measures as presented in Appendix G.

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	al. 2021.](1) Stationary systems must have a minimum of three hydrophones (accuracy can be greatly improved by using four hydrophones) and mobile systems (e.g. towed arrays) must have a minimum of two hydrophones.(2) Simulations should be conducted prior to selecting the number and location of receivers to maximize accuracy (i.e. reduce confidence intervals) in the final configuration.[Footnote 29: There are several mathematical methods to improve the accuracy of localization estimates by reducing the confidence intervals for each parameter that should be follow. See Spiesberger J. 2022.](3) Systems should be calibrated before deployment to ensure accurate detection capability.(4) For time-of-arrival based systems synchronization of data streams from the multiple receivers is necessary for accurate calculations.(5) Irrespective of the system used careful testing and documentation of localization errors should be undertaken. b) During pre-clearance and installation monitoring of the visual clearance and exclusion zones must be undertaken by vessel-based PSOs stationed at the installation site. On each vessel there must be a minimum of four PSOs following a two-on two-off rotation each responsible for scanning no more than 180 of the horizon per gravity-based or suction bucket foundation or floating offshore wind platform installation location. To effectively monitor the full exclusion zone for sea turtles multiple PSOs must be stationed at several vantage points at the highest level to allow each to continuously scan a section of the exclusion zone. Ensure PSOs do not exceed two consecutive watch hours on duty at any time have a two-hour (minimum) break between watches and do not exceed a combined watch schedule of more than 12 hours in a 24-hour period. PSO schedules should be designed to minimize observer fatigue. c) Acoustic and visual monitoring must be required and monitoring must begin at least 60 minutes prior to the commencement of installation activity and must be conducted throughout the duration of installation. Visual monitoring must continue until 30 minutes after installation. d) Additional observers and monitoring technologies (e.g. infrared drones hydrophones) must be deployed as needed to ensure the	

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	ability to monitor the established clearance and exclusion zones including during periods of darkness or poor visibility.	
BOEM-2024-0001-0450-0050	4) Require mandatory reporting of marine mammals and sea turtles detected during pre- clearance installation and 30 minutes after installation: a) All visual observations and acoustic detections of North Atlantic right whales to NOAA Fisheries or the United States Coast Guard must be reported as soon as possible and no later than the end of the PSO shift. We note that in some cases such as with the use of near real- time autonomous buoy systems the detections will be reported automatically on a pre-set cycle. b) Observations of entangled injured or dead North Atlantic right whales and other entangled injured and dead marine mammal species and sea turtles must be immediately reported to NOAA Fisheries' Northeast Marine Mammal and Sea Turtle Stranding and Entanglement Hotline (1-866-755-6622) for states from Maine to Virginia; NOAA Fisheries' Southeast Marine Mammal Stranding Hotline (1-877-942-5343) or Southeast Sea Turtle Stranding and Salvage Network (1-844-732-8785) for states from North Carolina to Florida; [Footnote 30: NOAA Fisheries "Report a Stranded or Injured Marine Animal" https://www.fisheries.noaa.gov/report.] or the United States Coast Guard via one of several available systems (e.g. phone app radio). Methods of reporting are expected to advance and streamline in the coming years and projects should commit to supporting and participating in these efforts. c) PSO sightings data must be submitted to BOEM as directed in any relevant guidance site assessment plan (SAP) or construction and operations plan (COP) approval or other agency protocol. Sightings data and reports provided to BOEM should be made publicly available by BOEM to inform marine mammal and sea turtle science and protection.	Thank you for your comment and suggestion. BOEM has reviewed and considered public comments on AMMM measures and revised the measures as presented in Appendix G. Please also see response to comment BOEM-2024-0001-0450-0047.
BOEM-2024-0001-0357-0024	AMMM Measures Exaggerated and Missing The draft program EIS does relies too much on visual observation and passive acoustic monitoring to detect whale presence and take mitigation actions (see Enclosure IX). It should also have addressed ascribing the BOEM and NMFS reliance on a 10 decibel pile driving source attenuation to bubble curtains and similar devices which is	Thank you for your comment. Both visual and acoustic monitoring have advantages and disadvantages under various conditions; using a suite of tools, including visual and acoustic monitoring, is necessary in the AMMM measures.

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	not technically justified. This is an important issue since many of the agency's positive conclusions regarding harm to marine mammals in the area depend on that flawed assumption (see Enclosure IX). For other impacts the AMMM measures it offers to mitigate adverse impacts are not adequate. For example with regard to the National Historic Preservation Act Section 106 process and the degrading impact of the wind complex on historic properties It provides virtually no substance mitigation measure. Meaningful measures such as restrictions on turbine height minimum turbine spacing particularly for the wind turbines closer to shore and turbine exclusion zones from shore are necessary to mitigate those effects. In fact the entire Section 106 process is flawed as summarized in Enclosure IX.	Using quieting technology (e.g., NAS) reduces the risk of noise impacts on marine mammals by reducing the sound levels that propagate from the pile source. Available studies suggest that when a single or combined NAS is applied to monopile installation, noise reductions ranging from 3 to 17 dB can be achieved depending on the NAS combination, with some frequency-dependent reductions of more than 20 dB (Bellmann et al. 2020).
BOEM-2024-0001-0450-0051	1) Require operational noise reduction to the fullest extent practicable. a) Operational noise should be reduced to the fullest extent practicable using best available technology and design principles. For example direct-drive turbines should be used instead of gear-box turbines and engineering solutions should be used to acoustically decouple the turbine from the mast and platform whenever possible. b) A detailed plan must be provided for how the operator will reduce operational noise output in the construction and operations plan submittal or in a separate plan submitted to BOEM and other relevant permitting agencies in advance of deployment. c) Underwater sound source measurements must be conducted during operations. Plans for sound source measurements including type and placement of equipment and frequency of measurements must be fully described in construction and operations plan submittals. Sound source measurements should follow any available BOEM protocol. d) Sound source measurements must be reported to BOEM as part of the annual certification required under 30 C.F.R. 285.633(a).e) Sound source measurement reports must be made available to the public within one month after the report is submitted to BOEM.	Thank you for your comment. BOEM has analyzed operational noise and, based on available data, believes that current mitigation is appropriate. However, BOEM will continue to monitor and adapt as needed.

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BOEM-2024-0001-0450-0031	Section II. Noise mitigation recommendations during site assessment and characterization1) Prohibit site assessment and characterization activities during times of highest risk for North Atlantic right whales: a) Site assessment and characterization activities involving high-resolution geophysical survey equipment with noise levels that could injure or harass marine mammals (at or below a frequency of 180 kHz) should not occur during periods of highest risk to North Atlantic right whales. Time periods of highest risk include but are not limited to during foraging and migration and times when mother-calf pairs pregnant females surface active groups (indicative of breeding or social behavior) or aggregations of three or more whales (indicative of feeding or social behavior) are or are expected to be present. Time periods must be defined based on the best available scientific information. b) If a near real-time monitoring system and mitigation protocol for North Atlantic right whales and other large whale species is developed and scientifically validated the system and protocol may be used to dynamically manage the timing of site assessment and characterization activities to ensure those activities are undertaken during times of lowest risk for all relevant large whale species. The development of such a protocol is particularly important where foraging aggregations of other large whale species are observed coincident with the times that noise-producing activities would most likely be undertaken based on times of lower relative risk to North Atlantic right whales.	Thank you for your comment. MMST-12 has been augmented with an updated version of mitigation measures established in BOEM's Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf) to minimize potential impacts on marine mammals, including NARW.
BOEM-2024-0001-0450-0033	3) Require the following clearance zone and exclusion zone distances prior to site assessment and characterization activities with noise levels known to injure or harass marine mammals (defined throughout this section as source levels at or below a frequency of 180 kHz):a) For North Atlantic right whales: i) A visual clearance zone and exclusion zone of at least 1000 m must be established around each vessel or sound source. ii) An acoustic clearance zone and exclusion zone of at least 1000 m must be established around each vessel or sound source.	Thank you for your comment. MMST-12 has been augmented with an updated version of mitigation measures established in BOEM's Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf) to minimize potential impacts on NARW, including establishing clearance zones.

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	b) If a large whale is detected visually or acoustically within the 1000 m clearance or exclusion zone but the species cannot be identified it must be assumed to be a North Atlantic right whale. c) For other large whale species coastal bottlenose dolphins harbor porpoises and manatees: i) A visual clearance zone and exclusion zone must extend at least 500 m in all directions from each vessel or sound source. d) For all other marine mammal species: i) Clearance and exclusion zone distances for other marine mammal species must be designed in a manner that eliminates Level A take and minimizes behavioral harassment to the fullest extent practicable.	
BOEM-2024-0001-0450-0034	4) Delay initiation or require shutdown of site assessment and characterization activities with noise levels known to injure or harass marine mammals (defined throughout this section as source levels at or below a frequency of 180 kHz) if a marine mammal is detected visually or if a North Atlantic right whale is detected acoustically in clearance and exclusion zones (as defined in Section II(3)): a) If a marine mammal species is visually detected within the relevant visual clearance zone for that species as defined under Section II(3) site assessment and characterization activities must not be initiated. b) If a marine mammal is visually detected within the relevant visual exclusion zone for that species as defined under Section II(3) site assessment and characterization activities must be halted. c) If a North Atlantic right whale is acoustically detected within the acoustic clearance zone site assessment and characterization activities must not be initiated. i) If localization as described in Section II(5)(a)(i) below cannot be achieved by acoustic detection site assessment and characterization activities should not be initiated upon detection of a North Atlantic right whale call regardless of distance from sound source. d) If a North Atlantic right whale is acoustically detected within the acoustic exclusion zone site assessment and characterization activities must be halted. i) If localization as described in Section II(5)(a)(i) below cannot be achieved by acoustic detection site assessment and characterization	Thank you for your comment. MMST-12 has been augmented with an updated version of mitigation measures established in BOEM's Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf) to minimize potential impacts on NARW, including: "If any protected species is observed within the respective Clearance Zone during the 30-minute pre-clearance period, the relevant acoustic sources must not be initiated until the ESA-listed whale (or unidentified whale) is confirmed by visual observation to have exited the relevant zone, or, until 30 minutes have elapsed with no further sighting of the animal."

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	activities should be suspended upon detection of a North Atlantic right whale call regardless of distance from sound source. e) Once halted site assessment and characterization activities may resume following the methods set forth in Section II(5) and after the lead PSO confirms no marine mammals have been detected within the relevant acoustic and visual clearance zones as defined under Section II(3).	
BOEM-2024-0001-0450-0035	5) Require robust monitoring protocols during pre-clearance and when site assessment and characterization activities are underway: a) Monitoring of the acoustic clearance zone must be undertaken using near real-time passive acoustic monitoring (PAM) [Footnote 20: Throughout this document "PAM" refers to a real-time passive acoustic monitoring system. NOAA and BOEM have defined minimum recommendations for use of PAM in monitoring and mitigation for offshore wind development. Van Parijs SM et al. 2021. "NOAA and BOEM Recommendations for Use of Passive Acoustic Listening Systems in Offshore Wind Energy Development Monitoring and Mitigation Programs." Front. Mar. Sci. 8. Available at https://www.frontiersin.org/articles/10.3389/fmars.2021.760840/full.] and must be undertaken from a vessel other than the survey vessel or from a stationary unit to avoid the hydrophone being masked by the survey vessel or development-related noise. i) The PAM system should be set up so that it is capable of localizing the position of vocalizing whales. A plan detailing any proposed localization system and analysis methods should be submitted to BOEM and other relevant permitting agencies in advance of deployment. The system should meet the following criteria:[Footnote 21: See also recommendations in Van Parijs SM et al. 2021.](1) Stationary systems must have a minimum of three hydrophones (accuracy can be greatly improved by using four hydrophones) and mobile systems (e.g. towed arrays) must have a minimum of two hydrophones.(2) Simulations should be conducted prior to selecting the number and location of receivers to maximize accuracy (i.e. reduce confidence intervals) in the final configuration.[Footnote 22: There are several mathematical methods to improve the accuracy of localization estimates by reducing the confidence intervals for each parameter that should be	Thank you for your comment. MM-2, real-time PAM monitoring and alert system for baleen whales, is recommended for all offshore wind development activities in the NY Bight.

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	follow. See Spiesberger J. 2022. Extremely reliable locations and calling abundance via passive acoustic monitoring. Oral Presentation. NYSERDA State of the Science Workshop. July 27 2022. https://www.youtube.com/watch?v- tV8ViBVQzg.](3) Systems should be calibrated before deployment to ensure accurate detection capability.(4) For time-of-arrival based systems synchronization of data streams from the multiple receivers is necessary for accurate calculations.(5) Irrespective of the system used careful testing and documentation of localization errors should be undertaken. b) During pre-clearance and when site assessment and characterization activities are underway monitoring of the visual clearance zone must be undertaken by vessel-based PSOs stationed on the survey vessel to enable monitoring of the entire clearance zones for marine mammals. On each vessel there must be a minimum of four PSOs following a two-on two-off rotation each responsible for scanning no more than 180 of the horizon. To effectively monitor the full exclusion zone multiple PSOs must be stationed at several vantage points at the highest level to allow each to continuously scan a section of the exclusion zone. Ensure PSOs do not exceed two consecutive watch hours on duty at any time have a two-hour (minimum) break between watches and do not exceed a combined watch schedule of more than 12 hours in a 24-hour period. PSO schedules should be designed to minimize observer fatigue. c) Acoustic monitoring for North Atlantic right whales and visual monitoring for marine mammal species must begin at least 30 minutes prior to the commencement or re- initiation of site assessment and characterization activity and must be conducted throughout the duration of activity.	
BOEM-2024-0001-0450-0036	6) Require underwater noise reduction to the fullest extent feasible: a) The impacts of underwater noise must be minimized to the fullest extent feasible including through the use of technically and commercially feasible and effective noise reduction and attenuation measures. For example project proponents should select and operate sub-bottom profiling systems at power settings that achieve the lowest practicable source level for the objective. The site	Thank you for your comment. G&G survey mitigations for floating wind (greater than 100 meters) as well as SAPs are out of the scope of the PEIS. BOEM may consider these recommendations in the future.

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	assessment plan submittal should provide detail as to how the operator has reduced noise output within the range of marine mammal audibility to the fullest extent feasible. b) For deep-water site assessment and characterization surveys (floating wind only): Where water depth is greater than 100 m survey equipment should be deployed using an autonomous underwater vehicle (AUV) operated 40 m above the seafloor. c) Project proponents should report the steps taken (including for example power settings used) to meet the recommendations in this subsection in the annual report of site assessment activities submitted to BOEM pursuant to 30 C.F.R. 585.615.	
BOEM-2024-0001-0450-0037	7) Require mandatory reporting of marine mammals and sea turtles detected during pre-clearance and site assessment and characterization activities: a) All visual observations and acoustic detections of North Atlantic right whales must be reported to NOAA Fisheries or the United States Coast Guard as soon as possible and no later than the end of the PSO shift. We note that in some cases such as with the use of near real- time autonomous buoy systems the detections will be reported automatically on a pre-set cycle. b) Observations of entangled injured or dead North Atlantic right whales and other entangled injured and dead marine mammal species and sea turtles must be immediately reported to NOAA Fisheries' Northeast Marine Mammal and Sea Turtle Stranding and Entanglement Hotline (1-866-755-6622) for states from Maine to Virginia; NOAA Fisheries' Southeast Marine Mammal Stranding Hotline (1-877-942-5343) or Southeast Sea Turtle Stranding and Salvage Network (1-844-732-8785) for states from North Carolina to Florida;[Footnote 23: NOAA Fisheries "Report a Stranded or Injured Marine Animal" https://www.fisheries.noaa.gov/report.] or the United States Coast Guard via one of several available systems (e.g. phone app radio). Methods of reporting are expected to advance and streamline in the coming years and projects should commit to supporting and participating in these efforts. c) PSO sightings data must be submitted to BOEM as directed in any relevant guidance site assessment plan (SAP) or construction and operations plan (COP) approval or other agency protocol. Sightings	Thank you for your comment. Sighting report requirements are covered in MM-1. Additionally, PSO reporting during data collection and site survey activities includes animal detection information. This requirement was included in MUL-10 in the Draft PEIS, which has now been split up and is included in MUL-10e.

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	data and reports provided to BOEM should be made publicly available by BOEM to inform marine mammal and sea turtle science and protection.	
BOEM-2024-0001-0450-0075	Measure ID and name: MUL-40: Operational noise reduction and monitoring Proposed description: "Operational noise reduction Lessees should reduce operational noise output to the fullest extent practicable using best available technology and design principles. Lessees shall use direct-drive motors for all turbines. A detailed plan for how the lessee will reduce operational noise output must be provided in the construction and operations plan submittal or in a separate plan submitted to BOEM and other relevant permitting agencies in advance of deployment. In this plan lessees must consider engineering solutions to acoustically decouple the turbine from the mast and platform in addition to other measures for reducing operational noise. The plan may be submitted as part of the noise mitigation plan (MUL-38)."Monitoring Project proponents must conduct underwater sound source measurements during operations. Plans for sound source measurements including type and placement of equipment and frequency of measurements must be described in construction and operations plan submittals. Sound source measurements should follow any available BOEM protocol. Project proponents must report sound source measurements to BOEM as part of the annual certification required under 30 C.F.R. 285.633(a). Project proponents must make sound source measurement reports available to the public within one month after the report is submitted to BOEM. "Resource Area Mitigated: Finfish Invertebrates and EFH; Marine Mammals Sea Turtles Fish Invertebrates Anticipated Enforcing Agency: BOEM and BSEE Notes: We recommend that BOEM establish a mitigation measure directing project proponents to reduce operational noise from turbines to the fullest extent practicable using best available technology and design principles. This includes a requirement that lessees use direct-drive motors instead of gear-boxes. Although MUL-5 provides generally that operators should use low noise best practices BOEM should establish a measure that specifically addresses operational noise to highlight the importance of mitigating this noise source. Because operational noise mitigation is best addressed by technology and	Thank you for your comment. BOEM has analyzed operational noise and, based on available data, believes that current mitigation is appropriate. However, BOEM will continue to monitor and adapt as needed.

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	engineering choices made during the construction phase the proposed language includes a requirement that project proponents submit a plan at the COP stage demonstrating consideration of alternatives for reducing operational noise. In this plan lessees are required to consider use of engineering solutions to acoustically decouple the turbine from the mast and platform In addition we recommend that project proponents conduct underwater sound source measurements during operations and make these measurements publicly available. We also recommend that BOEM develop a protocol or guidelines for monitoring underwater noise during operations.	
BOEM-2024-0001-0450-0076	Measure ID and name: MUL-41: Quieting of vessels engaged in activities on the OCS Proposed description: "Lessees are encouraged to achieve a quiet ship notation for all vessels particularly new builds used in construction operations and maintenance if feasible. The Lessee will evaluate the feasibility of this mitigation measure and will provide the evaluation to BOEM for review. Any instances where the Lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE." Notes: We recommend that BOEM establish a mitigation measure that encourages adoption of quiet ship notations for all vessels if feasible and requires concurrence by BOEM and BSEE of why adoption of such notations is infeasible.	Thank you for your comment; it will be taken into consideration. MUL-7 is an RP whereby BOEM encourages industry to consider the use of quieter vessels, particularly for new builds, per IMO guidelines.
BOEM-2024-0001-0259-0002	The Consensus Report issued the Recommendations that "The Bureau of Ocean Energy Management National Oceanic Atmospheric Administration and others should promote and where possible require observational studies DURING ALL PHASES OF WIND ENERGY DEVELOPMENT surveying construction operation and decommissioning that target processes at the relevant turbine to wind farm scales to isolate quantify and characterize the hydrodynamic effects." (p. 4-5 emphasis added). In 2023 NJ's efforts to move forward on the all-important development of renewable energy were thwarted in part by the sudden appearance of ocean mammal deaths off the NY & NJ coast which raised alarm and eroded public confidence in the project. Efforts by our organization to obtain data on the monitoring of pre-construction and survey	Thank you for your comment. BOEM will take the recommendations from the comment into consideration.

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	related were unsuccessful and instead the effort became a political football rather than a factually developed prospective evaluation of the 99-turbine development site a potentially immense impact as noted in the study cited above. Our ocean ecosystems the thriving of ocean mammals and other species and impacts on local fisheries among other effects are too important precious and sensitive to have impacts passed off by assumptions of what either advocates or critics of the projects were proposing as explanations for the greater than random mammal deaths. Please ensure adequate and independent research and evaluation modeling is required supported and provided for in any offshore wind turbine preparation and installation activities. Thank you.	
BOEM-2024-0001-0357-0040	So If an offshore wind energy program proceeds that choice to protect the right whale should be obvious. The Atlantic Shores project must be terminated to preserve the New Jersey shore experience and leave a path for the whale to migrate. 2. Limits on the total project nameplate megawatt capacity to allow flexibility in turbine size number and location 3. Limits on the individual turbine power to reduce the operational noise source level 4. Turbines excluded anywhere in the right whale's primary historic migration corridor 20 to 32 miles out to reduce the operational noise impact 5. Turbine exclusion zones on both sides of its 20 to 32 mile out primary migration corridor as shown in Enclosure II to reduce the noise levels within the corridor below the whale disturbance level of 120 decibels (dB) 6. During construction (including pile driving activities) and operation a robust passive acoustic monitoring (PAM) coverage system that extends the full radius of Level A and B harassment noise levels for the right whale 7. Throughout the operation of the project a PAM system in the whale's primary migration corridor to help detect its presence and cause a shutdown of power generation and 8. That all project vessels -- without exception -- must travel to and from the wind development area and within it at 10 knots or less. Again no exceptions for crew transfer vessels or any other kind of boat.	Thank you for your comment. While Atlantic Shores was considered as part of the cumulative analysis in this PEIS, specific concerns related to the project are not within the scope of this document. During the siting process for these projects, marine mammals (and other resources) were taken into consideration to limit potential impacts. Site-specific analyses will also be conducted at the project-specific NEPA stage.
BOEM-2024-0001-0357-0041	With respect to the cumulative impact of multiple vessel surveys discussed in Enclosure VIII AMMM measures should include: 1. A PAM system to help detect the whale's presence and shut down the	Thank you for your comment. MUL-26 was updated to consider ways to maximize efficiencies with additional coordination for monitoring and surveys.

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	survey operation and 2. Scheduling survey vessel paths to avoid the whale's primary migration corridor during its primary migration period. 3. The creation of a data sharing program to minimize the number of vessels and surveys needed.	
BOEM-2024-0001-0357-0045	With respect to the impact of operational turbine noise on fin and humpback whales that frequent the inner part of the project area (Exhibit 2): 1. A turbine exclusion zone of at least 17.2 miles from shore to reduce the likelihood that the operational turbine noise levels between the shore and the inner turbines (which will still be above 120 dB) will drive the whales to shore and cause beach stranding. SEE ORIGINAL ATTACHMENT A2: The Impact of Operational Turbine Noise on the Migration of the North Atlantic right whale from the Wind Energy Projects Planned off the New Jersey and New York Coasts	Thank you for your comment. During the siting process for these projects, marine mammals (and other resources) were taken into consideration to limit potential impacts. Site-specific analyses will be also conducted at the project-specific NEPA stage.
BOEM-2024-0001-0450-0074	Measure ID and name:MMST-15:Establishment of measures for construction of quiet foundations Proposed description: "Clearance zones during construction using quiet foundation types: • Lessees and operators must establish clearance zone and exclusion zone distances for marine mammals to eliminate Level A take and minimize behavioral harassment to the full extent practicable during installation of quiet foundation types (i.e. gravity-based or suction bucket foundations) considering noise levels expected to be generated during installation. • Lessees must establish clearance and exclusion zones of 100 meters for sea turtles. Monitoring during construction using quiet foundation types: Operators must conduct near real-time monitoring protocols during clearance and installation as follows: • Operators must conduct monitoring of the acoustic clearance and exclusion zones for North Atlantic right whales using near real-time PAM. Monitoring should be conducted from a vessel other than the installation vessel or from a stationary unit to avoid the hydrophone being masked by installation-related noise. The PAM system should be set up so that it is capable of localizing vocalizing whales as described in MM-2. • Operators must conduct monitoring of the visual clearance and exclusion zones by vessel based PSOs stationed at the installation	Thank you for your comment. If a project proposes quieter foundation types, additional or different mitigation measures can be revisited at the project-specific NEPA stage.

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	site. On each vessel a minimum of four PSOs must be established following a two-on two-off rotation each responsible for scanning no more than 180 of the horizon per installation location. To effectively monitor the full exclusion zone operators should station multiple PSOs at several vantage points at the highest level possible above the surface of the water to allow each to continuously scan a section of the exclusion zone. • Operators must begin acoustic and visual monitoring at least 60 minutes prior to the commencement of installation activity conduct monitoring throughout the duration of installation and continue visual monitoring until 30 minutes after installation. • Operators must use infrared technology to support visual monitoring during any activities that extend into periods of darkness. Operators should deploy additional observers and monitoring technologies (e.g. infrared drones or hydrophones) as needed to ensure the ability to monitor the established clearance and exclusion zones including during periods of darkness or poor visibility. Activity restriction and shutdown upon detection during construction using quiet foundation types: Operators must implement shutdown of activities if a marine mammal or sea turtle is detected visually or in the case of North Atlantic right whales acoustically as follows: ○ Installation of gravity-based and suction bucket foundations must not be initiated when the application of monitoring methods described in MMST-15 results in a detection of a marine mammal or sea turtle species within the relevant clearance zone. ○ Installation of gravity-based and suction bucket foundations must be stopped unless continued installation activities are necessary for reasons of human safety or installation feasibility when the application of monitoring methods described in MMST-15 results in a detection of a marine mammal or sea turtle species within the relevant exclusion zone. ○ If localization cannot be achieved by acoustic detection as described in MM-2 installation activities must be stopped	

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	upon detection of a whale call regardless of distance from the sound source. ○ Once halted installation may be resumed only after use of the monitoring methods described above and after the lead PSO confirms no marine mammal or sea turtle species have been detected within the relevant clearance zones. "Resource Area Mitigated: Marine Mammals Sea Turtles Anticipated Enforcing Agency: BOEM BSEE and NMFS Notes: We recommend that BOEM establish measures for mitigating noise impacts during construction of quiet foundation types (i.e. non-pile driving construction).If any of the mitigation measures in Appendix G that address construction are intended to apply to construction of quiet foundations as well as pile driving we recommend that BOEM clarify this fact.	
BOEM-2024-0001-0422-0017	MMST-3 Pile-driving clearance and shutdown zone adjustments Comment #15 on MMST-3 The requirement that the Lessee must submit the results of the field measurements to BOEM BSEE NMFS and USACE (when applicable) within 48 hours is potentially not feasible due to quality assurance efforts. Attentive Energy recommends providing a bit more time i.e. 72 hours to provide the report.	Thank you for your comment. MMST-3 has been revised in the Final PEIS. Additional changes based on this comment will be taken into consideration.
BOEM-2024-0001-0439-0055	Measure ID: MMST-3 Measure Name: Pile-driving clearance and shutdown zone adjustments Description: In order for pile-driving clearance and/or shutdown zones to be decreased the Lessee must request modification of the clearance and shutdown zones based on Thorough Sound Field Verification (MUL-29) measurements at a minimum of three foundations which must meet the Received Sound Level Limit (MUL-22) when effective as well as minimum seasonal distances for threatened and endangered species that may be specified in the Biological Opinion. If Sound Field Verification (SFV) measurements indicate that the isopleths of concern are larger than those considered in the Proposed Action for the COP NEPA analysis the Lessee must in coordination with applicable federal permitting agencies implement additional sound attenuation measures before driving any additional piles and conduct Thorough Sound Field Verification (MUL-29) for the subsequent three foundation installations. The Lessee must submit the results of the field	Thank you for your comment. MMST-3, MUL-22, and MUL-29 have been revised in the Final PEIS. Additional changes based on this comment will be taken into consideration.

Comment No.	Comment	Response
	measurements to BOEM BSEE NMFS and USACE (when applicable) within 48 hours. The agencies will provide direction to the Lessee on whether any additional modifications are required. Category: T/E G BACP Comment: Industry welcomes the ability to reduce clearance or shutdown zones based on the results in the field. However the criteria should be based on the specific project characterization. In addition expedited timeframes for agency review must be established to avoid construction delays. As discussed in MUL-22 meeting the "Received Sound Level Limit" and its associated SFV requirements are not technically or economically viable and will result in significant delays to projects. To simplify this measure ensure feasibility and consistency with consultations the text should be revised as follows: "Modifications to the clearance and shutdown zones (either decrease or increase) shall follow procedures stipulated in the NOAA Fisheries Incidental Take Authorization and Biological Opinion. "The concerns raised here and in MUL-22 highlight why BOEM must go through a robust guidance development process before imposing these measures on projects. This measure must be removed from consideration in the FEIS and instead considered during COP specific reviews. For the "Received Sound Level Limit" BOEM should engage in a robust public guidance development process that includes a public comment period workshops and outreach to industry stakeholders.	
BOEM-2024-0001-0450-0084	Measure ID and Name:MUL-5 Low Noise Best Practices Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):For onshore and offshore project activities and across all phases of construction and operations operators should use equipment technology and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment. See the following as examples: low noise foundation (MUL-6) vessel noise reduction BMP (MUL-7) and the received sound level limit (MUL-22). **Notes:** • The NY Bight PEIS can draw insights from various avian mapping data products such as MDAT marine bird models the Northwest Atlantic Seabird Catalog MBO CSAP database and incidental	Thank you for your comment. Because seabirds have a similar hearing range as some marine mammal species, the mitigations targeting marine mammals necessarily afford some protection to seabirds, as well. As more information becomes available on noise impacts on seabirds, additional mitigations explicitly for impacts on seabirds will be considered.

Comment No.	Comment	Response
	records from eBird revealing a diverse assemblage of diving marine **birds** in the area. • While offshore wind activities' sound mitigation measures typically target marine mammals sea turtles fishes and invertebrates diving bird taxa possess hearing thresholds in the frequency band 1-4 kHz similar to seals and toothed whales. Diving seabirds change their foraging behavior and increase distances from sound sources during acoustic disturbances with avoidance distances reaching tens of kilometers. The existing monitoring framework for the NY Bight PEIS overlooks potential adverse injuries from acoustic disturbances to diving birds during project construction and/or operations. Measures such as seasonal curtailment may be justified to minimize harm particularly for species like Razorbills which can dive to depths of 140 meters and are sensitive to loud noises. • Diving bird densities peak during winter on inner and middle shelf habitats in the Atlantic OCS portion of the NY Bight region. Seasonal shifting of noisy operations or other sound abatement methods such as establishing safety zones monitored by visual observers using noise reduction gear like bubble curtains or deploying noise-source modifications may mitigate risks to diving birds if time/area closures are not practical.	

Table P.5.23-4. Responses to Substantive Comments on Mitigation and Monitoring—Scenic and Visual Resources (VIS)

Comment No.	Comment	Response
BOEM-2024-0001-0406-0021-a	VIS-1 to VIS-6 which would regulate onshore visual impacts in potential tension with state permitting requirements. For instance many of BOEM's proposed measures are inconsistent with current practice within New York and New Jersey and in urban settings.	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any previously identified AMMM measure that is now an RP has been removed from Alternative C. VIS-1 through VIS-6 are measures that are now RPs. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. In addition, potential visual impacts will be evaluated again at the project-specific COP NEPA stage.

Comment No.	Comment	Response
BOEM-2024-0001-0357-0067	Missing AMMM Measures. The program EIS fails to include many meaningful measures some suggested in Enclosure I. For example the AMMM measures put forth to address the adverse effects of the project through the National Historic Preservation Act Section 106 process are entirely inadequate. In fact the entire process is seriously flawed. Meaningful measures to mitigate the visible rotating blades impact and operational turbine airborne noise impact on shore historic properties must be presented. These include (see also Enclosure I) limitations on turbine height and power minimum spacing between turbines of at least 2 nautical miles and most notably turbine exclusion sones from shore to reduce the adverse effect on historic properties.	BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. Additional mitigation measures proposed by the public can be considered by BOEM during subsequent COP-specific NEPA reviews.
BOEM-2024-0001-0313-0024	Affected Environment and Environmental Consequences 3.6.9-59 The PEIS also states 'Presence of structures: Several AMMM measures (VIS-1 VIS-2 VIS-3 VIS-4 and VIS-5) would minimize visual contrast impacts associated with onshore infrastructure (e.g. substations/converter stations transmission towers). These measures would involve selecting transmission towers that minimize visual contrast color treating onshore infrastructure to reduce visual contrast using non-specular conductors for overhead transmission powerlines to avoid glare using color-treated polymer insulators to reduce glare and treating security fencing to eliminate glare and visual contrast. These measures would assist with impacts to SLIA character areas and VIA viewer experiences from future KOPs (determined in the COP VIA) in the vicinity of future onshore infrastructure." Comment Again the chemical composition and potential environmental impact of these coatings and polymer additives should be evaluated and addressed in the final PEIS.	BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. VIS-1 through VIS-5 are now RPs. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. Polymer insulator is a common product and coatings are also standard. These products and coatings are commonly used in the electrical transmission industry as well as in other industries. Conducting assessments of the environmental effects of the chemical compositions on the environment is not foreseen as necessary at this time.
BOEM-2024-0001-0439-0095	Measure ID: VIS-1 Measure Name: Onshore transmission tower visual contrast mitigation Description: Lessees should select a transmission tower type that has the least amount of visual contrast within the surrounding setting and the extended landscape within view of which the transmission line is routed through in order to avoid undue and unnecessary visual impact. Monopoles typically have less visual contrast within built environments whereas lattice towers typically have less visual contrast in more natural settings. Lessees must color-treat the transmission tower darker grays	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any previously identified AMMM measure that is now an RP has been removed from Alternative C. VIS-1 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. Subsequent project-specific NEPA analysis will evaluate the specific design features proposed in COPs.

Comment No.	Comment	Response
	(chemically treated galvanized finishes) to reduce visual contrast or powder-coat the tower with Bureau of Land Management Environmental Color Covert Green or Shadow Gray or a BOEM-approved equal submitted by the Lessee for settings where Covert Green or Shadow Gray does not minimize the visual contrast. Lessees must prepare photo simulations of proposed onshore facilities with and without mitigation measures described in VIS-1. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov. Previously Applied as a COP T&C: Category: JACP Comment: The PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. This measure is overly prescriptive. Selection of transmission tower types will be based on site-specific engineering requirements. Overhead transmission towers are not anticipated or limited to riser poles. BLM color scales are inappropriate in urban/suburban geography. Selection is dependent on site-specifics and subject to state and local requirements regarding height setbacks color etc.	
BOEM-2024-0001-0439-0096	Measure ID: VIS-2 Measure Name: Onshore substation visual contrast mitigation Description: Lessees should color treat all substation facilities the same color and color-treated to minimize visual contrast with the surrounding setting and the extended landscape within view. The default color choice for substations must be Bureau of Land Management Environmental Color Covert Green or Shadow Gray or a BOEM-approved equal submitted by the Lessee for settings where Covert Green or Shadow Gray does not minimize the visual contrast in order to avoid undue and unnecessary visual impact. Lessees must prepare photo simulations of proposed onshore facilities with and without mitigation measures described in VIS-2. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov. Previously Applied as a COP T&C: Category: JACP Comment: The PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. This measure is overly prescriptive. While general use of an exterior finish that reduces visual contrast with the surrounding setting is a reasonable commitment exterior finishes on substation facilities will be subject	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any AMMM measure that was reclassified as an RP has been removed from Alternative C. For example, VIS-2 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. Subsequent project-specific NEPA analysis will evaluate the specific design features proposed in COPs.

Comment No.	Comment	Response
	to state and local requirements (e.g. under Article VII and any municipal requirements negotiated under Article VII settlement procedures) and on stakeholder input. BLM color scales are inappropriate in urban/suburban geography. What color should be used in the "baseline" photo simulation without mitigation?	
BOEM-2024-0001-0439-0097	Measure ID: VIS-3 Measure Name: Onshore overhead transmission conductors visual contrast mitigation Description: Lessees should use non-specular conductors for overhead transmission powerlines to avoid glare commonly associated with untreated conductors to avoid undue and unnecessary visual impact. Lessees must prepare photo simulations of proposed onshore facilities with and without mitigation measures described in VIS-3.Previously Applied as a COP T&C: Category: JACP Comment: The PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. This measure is overly prescriptive. Use of overhead conductors is unlikely or extremely limited. Use of non-specular conductors would be dependent on availability from cable OEM. The difference between specular and non-specular conductors is likely indiscernible in visual simulations at applicable scales of photo simulations from KOPs and therefore this should be eliminated from this measure.	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any AMMM measure that was reclassified as an RP has been removed from Alternative C. For example, VIS-3 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. Subsequent project-specific NEPA analysis will evaluate the specific design features proposed in COPs.
BOEM-2024-0001-0439-0098	Measure ID: VIS-4 Measure Name: Onshore overhead transmission line insulator visual contrast mitigation Description: Lessees should use polymer insulators to minimize glare commonly associated with glass insulators. Lessees should use polymer insulators that are a color that minimizes visual contrast with the surrounding setting and the extended landscape that is within view to avoid undue and unnecessary visual impact. The default color choice for polymer insulators substations should be Bureau of Land Management Environmental Color Covert Green or Shadow Gray or Sudan Brown or a BOEM-approved equal submitted by the Lessee for settings where Covert Green or Shadow Gray or Sudan Brown do not minimize the visual contrast. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov. Lessees must prepare photo simulations of proposed onshore facilities with and without mitigation measures described in VIS-4.Previously Applied as a COP T&C: Category: JACP Comment: The	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any AMMM measure that was reclassified as an RP has been removed from Alternative C. For example, VIS-4 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. The specific colors for insulators will be reviewed during subsequent NEPA analysis based on project-specific information provided in COPs.

Comment No.	Comment	Response
	PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. This measure is overly prescriptive. BLM color scales are inappropriate in urban/suburban geography.	
BOEM-2024-0001-0439-0099	Measure ID: VIS-5 Measure Name: Onshore facility security fencing visual contrast mitigation Description: Lessees should ensure galvanized and other types of security fencing are treated to eliminate glare and color-treated to minimize visual contrast with the surrounding setting and the extended landscape that is within view to avoid undue and unnecessary visual impact. Methods include vinyl-coating powder-coating and oxidizing treatments. Colors must be dark brown dark grays or dark brown (oxidizing treatments only). Lessees must prepare photo simulations of proposed onshore facilities with and without mitigation measures described in VIS-5.Previously Applied as a COP T&C: Category: JACP Comment: The PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. This measure is overly prescriptive. Further the difference between galvanized and ungalvanized fencing is likely indiscernible in visual simulations at applicable scales of photo simulations from KOPs and therefore this should be eliminated from this measure.	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any AMMM measure that was reclassified as an RP has been removed from Alternative C. For example, VIS-5 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. Subsequent project-specific NEPA analysis will evaluate the specific design features proposed in COPs.
BOEM-2024-0001-0439-0100	Measure ID: VIS-6 Measure Name: Onshore facility lighting Description: In order to avoid undue and unnecessary visual impact Lessees should ensure artificial light at night needed for nighttime operations and security at onshore facilities such as operational and maintenance facilities substations and others follows the night lighting principles to avoid light pollution and the artificial lighting best management practices outlined in the Bureau of Land Management Technical Note 457 available at https://www.blm.gov/sites/default/files/docs/2023-05/IB2023-038_att1.pdf. Lessees must prepare photo simulations of proposed onshore facilities with and without mitigation measures described in VIS-6.Previously Applied as a COP T&C: Category: JACP Comment: The PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. Nighttime simulations at onshore substations is atypical.	Thank you for your comment. BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. Any AMMM measure that was reclassified as an RP has been removed from Alternative C. For example, VIS-6 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. The use of galvanized steel fencing will be reviewed during subsequent NEPA analysis based on project-specific information provided in COPs.

Comment No.	Comment	Response
	Onshore substations are expected to be located in areas characterized by high levels of existing ambient lighting. Static imagery photo- simulations will not be able to meaningfully depict this visual distinction between lighting BMPs and baseline conditions.	
BOEM-2024-0001-0439-0101	Measure ID: VIS-7 Measure Name: Monitoring impacts on scenic and visual resources Description: In coordination with BOEM the Lessee must prepare and implement a scenic and visual resource monitoring plan that monitors and compares the visual effects of the wind farm during construction and operations/maintenance (daytime and nighttime) to the findings in the COP Visual Impact Assessment and verifies the accuracy of the visual simulations (photo and video).The monitoring plan must include monitoring and documenting the meteorological influences on actual wind turbine visibility over a duration of time from selected onshore key observation points as determined by BOEM and the Lessee. In addition the Lessee shall include monitoring the operation of ADLS in the monitoring plan. The Lessee must monitor the frequency that the ADLS is operative documenting when (dates and time) the aviation warning lights are in the on position and the duration of each event. Details for monitoring and reporting procedures must be included in the plan. Previously Applied as a COP T&C: Category: J ACP Comment: The PEIS indicates that this measure is outside BOEM jurisdiction. Measures outside BOEM's jurisdiction should not be included in AMMMs. What is the purpose of monitoring visual affects after the wind farm is built? Lessees go through a very exhaustive visual assessment provide mitigation and should not be required to undertake additional assessment. NEPA mitigation is for reasonably foreseeable impacts not unanticipated /unforeseen impacts which is inconsistent with NEPA. With respect to ADLS Lessees should not be required to monitor dates and times when ADLS is activated. The FAA tracks all air traffic and can determine when the ADLS is activated.	VIS-7 was revised to specify that implementation of this AMMM measure is within BOEM's jurisdiction and that the monitoring timeframe is 3 years of operation, with the possibility of extension depending on consistency in data results. The benefit of monitoring visual effects is to validate the visual simulations. ADLS records are already maintained in case FAA requests them. Under this AMMM measure, BOEM is also requesting records of the actual frequency and duration of ADLS operation.
BOEM-2024-0001-0406-0019	VIS-7 requiring the submittal of a scenic and visual resource monitoring plan. The NYB projects are going to be sited far enough from shore and often behind other wind farms nearer to shore that onshore visual impacts will be negligible to non-existent. See Draft	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0439-0101. Subsequent project-specific NEPA analysis will evaluate the detailed information proposed in COPs.

Comment No.	Comment	Response
	PEIS Table 3.6.9-27. Monitoring plans are time- and resource-intensive; as such they should be reserved for instances in which the data collected could contribute to adaptive management of serious anticipated impacts or otherwise ensure compliance with the conditions of the COP. See 50 CFR 1505.3 ("Agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases.") Restraint is also called for where as here project proponents are already being inundated with post-COP approval submittals (see section II.b.v below).	

Table P.5.23-5. Responses to Substantive Comments on Mitigation and Monitoring—Cultural Resources (CUL)

Comment No.	Comment	Response
BOEM-2024-0001-0357-0067	Missing AMMM Measures. The program EIS fails to include many meaningful measures some suggested in Enclosure I. For example the AMMM measures put forth to address the adverse effects of the project through the National Historic Preservation Act Section 106 process are entirely inadequate. In fact the entire process is seriously flawed. Meaningful measures to mitigate the visible rotating blades impact and operational turbine airborne noise impact on shore historic properties must be presented. These include (see also Enclosure I) limitations on turbine height and power minimum spacing between turbines of at least 2 nautical miles and most notably turbine exclusion sones from shore to reduce the adverse effect on historic properties.	Visual AMMM measure VIS-7 requires lessees to prepare and implement a scenic and visual resource monitoring plan. VIS-8 is an RP that encourages lessees to evaluate the other visual measures identified as RPs in PEIS Appendix G (see VIS-1 through VIS-6). BOEM is developing a Programmatic Agreement through the Section 106 process that identifies processes for evaluating and resolving visual effects on historic properties. Because effects on historic properties are project and site specific, visual effects will be evaluated at the project-level NEPA and Section 106 reviews. A lessee is allowed to use a PDE as part of its COP submission. The PDE can include a range of facilities and facility-related options such as number of WTGs and OSSs, and WTG size range (height) or spacing. The PDE approach is now codified in via the Modernization Rule via 30 CFR 585.113 (definitions) and its use as part of a COP submission via 30 CFR 585.626. BOEM’s regulations allow for BOEM to decide when a PDE is acceptable. The acceptability will typically be linked to whether a PDE is too unreasonably broad or vague to be effectively analyzed through NEPA or consulted upon with another agency, or if there is not enough detail in the COP to ensure sufficient safety and technical feasibility to support a COP approval. BOEM is developing recommendations for PDE limits in its pending

Comment No.	Comment	Response
		updated COP and PDE Guidelines, but those are recommendations and not requirements/regulations. BOEM can address concerns with impacts through the development of alternatives in the COP NEPA review. However, these alternatives must align with the project's purpose and need and primary goals of the applicant/lessee. Additionally, the alternatives must be both technically and economically feasible. For example, if a project's purpose and need and goal are tied to the delivery of an awarded Power Purchase Agreement generation capacity, BOEM cannot include an alternative that would reduce the number of WTGs needed to meet that generation capacity (this includes considering transmission losses). Similarly, BOEM can develop mitigation measures to address specific project impacts, including measures to mitigate adverse effect son historic properties through the NHPA Section 106 review for the COP, that would be instituted as part of the Section 106 Memorandum of Agreement, BOEM's ROD, and BOEM's conditions of COP Approval. However, those must be technically and economically feasible. For example, BOEM cannot require an applicant/lessee to use to a WTG size that does not exist or is not commercially available. BOEM could potentially adjust a wind facility's layout (modify the array spacing) via an alternative or mitigation if the purpose and need and goals were achievable while also being technically and economically feasible. BOEM needs to know the PDE for the actual project (a project-specific COP) to use these mechanisms. The project-specific details in conjunction with BOEM's environmental analysis at the COP stage allow BOEM to assess which alternatives, mitigation, and conditions of COP approval are appropriate.
BOEM-2024-0001-0423-0014	Cultural Resources Cultural resources impacts are highly project specific. As documented in Appendix H (Seascape Landscape and Visual Impact Assessment) Bluepoint Wind's visual impacts are the smallest by far of the six lease areas being the farthest away from land (approximately 43.7 statute miles off the New York coast and approximately 61 mi off the New Jersey coast) and are likely to be even less impactful than the Appendix H analysis which assumed taller turbines than have been designed for the industry. It is highly	BOEM has removed CUL-6 from consideration as an AMMM measure in the PEIS. Compensatory mitigation is project specific and would be formalized at the project-specific COP NEPA and consultations stage. Because it is project specific, CUL-7, Section 106 mitigation fund, was classified as an RP for the Final PEIS.

Comment No.	Comment	Response
	unlikely that the Bluepoint Wind project will be visible from the historic properties examined in the Draft PEIS. As such Ocean Winds insists that those impacts and mitigation measures tied to visual impact should be determined at the individual COP review stage and not generalized in a PEIS. For example [bold: CUL-6] is phrased as a mandatory requirement [italicized: "BOEM with assistance from lessees must develop and implement one or more historic property treatment plans"] to address unavoidable adverse effects. [bold: CUL-7] states BOEM [italicized: "may request that lessees contribute financially to a compensatory mitigation fund to address impacts on historic properties related to OCS offshore wind activities."] Including those AMMMs in the PEIS sets an expectation that they will be applied to all projects and sets project specific EISs up for potential legal challenge should they not include those plans and funding. At the very least BOEM should clarify that such compensatory mitigation would be scaled based on the level of unavoidable impact and that some projects may not have such impacts.	

Table P.5.23-6. Responses to Substantive Comments on Mitigation and Monitoring—Air Quality (AQ)

Comment No.	Comment	Response
BOEM-2024-0001-0406-0017	i. Measures That Are Technically or Commercially Infeasible Many of the proposed AMMM measures would force the adoption of novel technologies strategies or guidance that are not technically or commercially feasible to implement now or in the foreseeable future and/or have not been formally accepted as options for use by BOEM and other cooperating agencies. It would be inappropriate for BOEM to make weighty suitability determinations regarding such measures through a regional PEIS particularly where it has introduced so many presenting dozens of novel issues. If BOEM wishes to advance such measures it must conduct focused inquiries into each's feasibility. That sort of inquiry is an appropriate use of tools such as Requests for Information under 30 CFR 585.116 but not an appropriate use of the PEIS process. Examples of measures that fall into this category include: AQ-1 to AQ-7 which would require lessees to replace vessels and equipment that emit greenhouse gases with ones that use	Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have been included in previous BOEM COP approvals from AMMM measures that have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information. BOEM's review and revision of AMMM measures has resulted in AQ-1 through AQ-7 becoming RPs. MUL-22 was analyzed as an AMMM measure that has not been previously applied.

Comment No.	Comment	Response
	reduced- or zero-emissions technology. While we embrace the objectives behind this measure such vessels are either in extremely limited supply (e.g. cleaner fuels under AQ2) or not currently feasible at all (e.g. non-SF6 switchgear electrified service operation vessels and retrofitted diesel engines). Requiring all NYB projects to use these vessels would cause significant delays and cost overruns for each of the projects. Moreover as discussed in detail in the public comments submitted by the American Clean Power Association in which COSW joins the Environmental Protection Agency has jurisdiction over air emissions and has already determined through BACT analyses conducted under its Clean Air Act OCS permit program for several recent offshore wind permit applications that many of these proposed measures are infeasible. MUL-22 which would require sound level thresholds for pile-driving that are not technologically feasible for the anticipated foundation sizes in the timeframe described. This measure would create a de facto maximum size foundation which could increase environmental impacts by requiring the installation of more foundations to meet the same electrical generation capacity and to support meeting clean energy goals.	
BOEM-2024-0001-0406-0020	iv. Measures That Lie Outside of BOEM's Jurisdiction Certain of the AMMM measures proposed in the Draft PEIS particularly those relating to onshore impacts are outside of BOEM's authority to implement. "Agencies should not commit to mitigation however unless they have sufficient legal authorities and expect there will be necessary resources available to perform or ensure the performance of the mitigation." CEQ Mitigation and Monitoring Guidance at 5 (Jan. 2011). Appendix G appears to propose adoption of numerous measures that can only be imposed and enforced by other agencies through federal state- and local-level permitting in contravention of CEQ guidance. Examples include: AQ-6 and AQ-7 under which BOEM would inappropriately regulate onshore air emissions. Authority to regulate air emissions rests with the EPA and with the states in the onshore environment for non-major sources. The fact that onshore components of an offshore wind project may generate minor amounts of emissions may be relevant to BOEM's COP NEPA analysis but does not give it authority to impose emissions limitations or	Refer to response to comment BOEM-2024-0001-0406-0017. AMMM measures are now structured to indicate which have or have not been previously applied, and which are RPs. BOEM can incorporate mitigation considerations and recommendations into planning. AQ-6 and AQ-7 are now RPs that include a caveat for feasibility concerns. Regarding the Footnote 7 statement of cable siting needed pre-COP submittal, the commenter’s statement is not correct. Multiple options for cable routing are often investigated throughout the process and additional changes in routing may be identified throughout the consultation process, which could result in the need for further survey work. Lessees have often requested to conduct additional cable routing surveys post COP submittal. The ultimate route(s) chosen can be a condition of COP approval.

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	control requirements on a project. While discussed above in Section IV(b)(i) Measures that are technically and commercially infeasible AQ 1-5 also appear to be under the jurisdiction of the EPA under its Clean Air Act OCS permit program. MUL-18 under which lessees "should coordinate transmission infrastructure among projects." Although it is listed as "voluntary" its adoption would overstep BOEM's jurisdiction by interfering with a process that is largely driven by state procurement decisions and other factors that are largely beyond a project developer's control including the timing of siting permitting and construction of the regional collector line. While we recognize that utilizing a shared transmission has the potential to minimize conflicts with various other ocean uses and increase overall efficiencies its adoption must be driven by state and commercial considerations and not minimization and mitigation requirements imposed in a NEPA review. [Footnote 7: This obligation is inappropriate as an AMMM measures for the additional reason that the siting of cables must be made pre-COP submittal so that developers can collect the geophysical and geotechnical data required in a COP per the NOI Checklist. Cable routing therefore cannot also be a condition of COP approval.]	
BOEM-2024-0001-0439-0018	V. BOEM should remove certain AMMMs from consideration. Even assuming BOEM reframes the PEIS and acknowledges that the agency is considering AMMM measures that it [italicized: may] require as conditions of approval it should remove from consideration certain inappropriate AMMMs. Attachment A provides the OSW industry's detailed comments on specific AMMMs. As demonstrated by those comments many of the AMMMs proposed by BOEM are inappropriate because to varying degrees they are outside of BOEM"s statutory authority and are duplicative are more suitably proposed as COP guidance will be technically or economically infeasible will create untenable safety issues or undue burden on industry and/or are voluntary. a. BOEM should remove AMMMs that are outside their statutory authority and duplicative. An agency "may not exercise its authority in a manner that is inconsistent with the administrative structure that Congress enacted into law."[Footnote 38: Food and Drug Admin. v. Brown & Williamson Tobacco Corp. 529 U.S. 120 125 120 S.Ct.	Refer to response to comment BOEM-2024-0001-0406-0017. AMMM measures are now structured to indicate which have or have not been previously applied, and which are RPs. BOEM can incorporate mitigation considerations and recommendations into planning. AQ-1 through AQ-5 are now RPs that include a caveat for feasibility concerns. MMST-13 has been removed and incorporated into MMST-14. BOEM’s review and revision of AMMM measures has resulted in EJ-1 from the Draft PEIS being split into a not previously applied AMMM measure (EJ-1a) and an RP (EJ-1b); these AMMM measures have been revised to further reduce potential duplication with existing state and local requirements and describe how lessees may refer to other requirements to satisfy the AMMM measure. MUL-7 is now an RP and has been updated for clarity.

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	1291 146 L.Ed.2d 121 (2000) (quoting ETSI Pipeline Project v. Missouri 484 U.S. 495 517 108 S.Ct. 805 98 L.Ed.2d 898 (1988)).] As such BOEM cannot implement AMMMs that are outside of its authority. While a NEPA analysis can review mitigation measures that are not within an agency's authority the agency cannot impose these measures on the lessee or adopt them in a ROD but can only cross-reference those measures to provide for interagency coordination. In fact "Agencies should not commit to mitigation however unless they have sufficient legal authorities and expect there will be necessary resources available to perform or ensure the performance of the mitigation."[Footnote 39: Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact 76 FR 3843 (Jan. 2011)] Indeed BOEM itself notes that not all "AMMM measures are within BOEM's statutory and regulatory authority; those that are not may still be adopted and imposed by other governmental agencies."[Footnote 40: DPEIS Appendix G.] As such BOEM should not develop duplicative or additive AMMM[Footnote 41: As discussed below the AMMM implies it is within BOEM's authority to issue. Instead BOEM should simply analyze the environmental effects of air permits that would be required by EPA.] or impose any requirements for measures that fall outside of their statutory authority. Instead BOEM should defer to cooperating agencies with regulatory authority to impose certain mitigation measures.[Footnote 42: See Wyoming v. U.S. Dep't of the Interior 493 F. Supp. 3d 1046 (D. Wyo. 2020) (BLM rule referencing EPA regulations "usurps the authority to regulate air emissions Congress expressly delegated to the EPA").] For example AQ-1 through AQ-5 would impose air quality requirements; however emissions in the NY Bight lease area are regulated by the Environmental Protection Agency ("EPA") under its Clean Air Act regulations at 40 C.F.R. Part 55. AQ-1through AQ-5 are duplicative of EPA's air permit process and create the potential for conflicting requirements and confusion. Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New	

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	Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. For example with respect to AMMM AQ-4 as part of the BACT/LAER analysis applicants will assess the feasibility of add-on pollution controls (e.g. Selective Catalytic Reduction Selective Non-Catalytic Reduction NOx Adsorber/Scrubber Lean NOx Catalysts SOx Scrubber Diesel Particulate Filter Diesel Oxidation Catalyst etc.) on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why these add-on pollution controls are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. BOEM should not use its AMMMs to reinforce existing standards or legal requirements over which it has no authority itself. Similarly MMST-13 attempts to characterize existing vessel speed rules but may ultimately create conflict if those regulations are modified. EJ-1 would require lessees to develop an Environmental Justice Communications Plan but an Environmental Justice Plan is already required by both the states of New York and New Jersey. AMMMs that are duplicative of (and potentially in conflict with) existing state or Federal requirements should be removed from BOEM's proposed AMMMs. Finally with AMMM MUL-7 BOEM attempts to meet International Maritime Organization ("IMO") standards. These standards are outside of BOEM's jurisdiction and authority and BOEM may not use AMMMs developed through NEPA to enforce compliance with those standards (see Attachment A for additional examples).	
BOEM-2024-0001-0436-0012	b. Duplicative Requirements Some new AMMMs are duplicative with the requirements of other federal and state regulatory processes and risk inconsistency with other agency authorities. The increased regulatory burden of AMMMs that are duplicative or overlap with other agency authorities runs counter to the efficiency-based purpose and need for the PEIS and has the potential to jeopardize the success of offshore wind projects in the New York Bight. For example the Environmental Protection Agency (EPA) has jurisdiction and subject matter expertise over AMMMs AQ-1 (Using a substitute insulator gas	Refer to response to comment BOEM-2024-0001-0406-0017. AMMM measures are now structured to indicate which have or have not been previously applied, and which are RPs. BOEM can incorporate mitigation considerations and recommendations into planning. AQ-1 through AQ-5 are now RPs that include a caveat for feasibility concerns. AQ-8 is also included as an RP in the Final PEIS.

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	in the switch gears and transmission systems to the maximum extent possible) AQ-2 (Cleaner fuels for vessels equipment and vehicles engaged in activities on the OCS) AQ-3 (Electrification of vessels equipment and vehicles engaged in activities on the OCS) and AQ-4 (Exhaust aftertreatment for vessels engaged in activities on the OCS). These air quality AMMMs are duplicative of EPA's Outer Continental Shelf (OCS) Air Permit process under OCS Air Regulations. [Footnote 6: 40 CFR Part 55]In the Final PEIS BOEM should identify those new AMMMs that fall under the authorities of other agencies and cross reference the permit and/or consultation processes where those measures will be given proper consideration rather than reiterate such requirements.	
BOEM-2024-0001-0439-0020	c. BOEM should remove AMMMs that are technically and economically infeasible. As stated above NEPA requires agencies to "study develop and describe technically and economically feasible alternatives"[Footnote 44: 43 U.S.C. 4331.] A number of the newly proposed AMMMs are technically and economically infeasible will create unsafe conditions and/or impose undue burden on developers (see Attachment A for additional examples).MUL-22 - Received Sound Level Limit: It is premature to implement new requirements on sound mitigation prior to a thorough and complete analysis of learnings from the construction of the South Fork Wind Farm and Vineyard Wind 1 projects including measured sound fields sound abatement techniques relative effectiveness of mitigation and monitoring measures and documented exposures above relevant thresholds. Ignoring this experience robs BOEM and the industry of the opportunity to learn and improve based on the most recent science and practical considerations. It remains unclear how and to what extent the proposed thresholds will reduce the amount of acoustic exposure and whether these reductions meaningfully increase protection of marine wildlife. Empirical data compiled from projects in construction should be presented and discussed at the joint forums. This measure fails to account for trends in offshore wind technology particularly the use of larger wind turbines and associated larger foundations and piles. Large turbines are essential to make efficient use of the nation's offshore wind resource and to meet President Biden's offshore wind and climate goals myriad State	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-1 through AQ-3 are now RPs that include a caveat for feasibility concerns. MUL-22 and MUL-29 have been revised for clarification in the Final PEIS. These AMMM measures are identified to find an effective approach, within the existing regulatory framework, to address environmental and compliance concerns. BOEM is recommending these measures with emphasis on practicability.

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	goals and individual projects' offtake agreements. Finally mitigation measures for marine wildlife fall under NOAA's authority under the MMPA.MUL-29 - Sound Field Verification (SFV) Process Plan and Reporting: This process will result in significant construction delays to projects and is not economically or technically feasible. Requiring SFV at every turbine location would be unnecessary and cost prohibitive. A standardized target sub-sample of turbine locations would be more than sufficient to determine the effectiveness of sound reduction mitigation measures. Empirical data compiled from the projects currently conducting SFV could be discussed at our proposed BOEM-industry forum and would inform a broader discussion on how best to incorporate lessons learned from early projects. This measure could also unintentionally exacerbate stressors on marine mammals. For example construction time could be extended unnecessarily to accommodate repeated attempts to reduce sound to a specific level (e.g. start-up test fail sound limit shut down add bubble curtain start-up fail by lesser degree shutdown and so on). Also more extensive sound field verification requires additional vessels and equipment which counterproductively adds to the ambient sound level. AMMMs AQ-2 and AQ-3 require lessees to replace diesel fuel and marine fuel oil with alternative fuels such as natural gas propane or hydrogen for vessels and require the replacement of combustion engines with zero-emissions technology (fuel cell-electric or battery- electric) for vessels. Requiring developers to use alternative fuels or zero-emissions technology would severely limit project feasibility since the supply chain for vessels both current and new builds would be constrained to very few vessels globally. Considering the benefits of GHG reductions from deployment of offshore wind power the burden of this mitigation measure is disproportionate given the magnitude of GHG emissions during the relatively brief construction period. AMMMs AQ-2 encourages lessees to replace diesel fuel and marine fuel oil with alternative fuels. Requiring a technical and/or economic feasibility analysis for not using these vessels places an undue burden on developers because of the lack of these vessels in the market both now and in future construction trends. While there are over 25 different types of vessels needed to construct and	

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	maintain an offshore wind project[Footnote 45: See https://cleanpower.org/resources/offshore-wind-vessel-needs/.] ACP did an analysis of 5 vessel types that provide a good representation of the vessel size and work scope across the industry including Crew Transfer Vessels Heavy Lift Vessels Rock Installation vessels Service Operation Vessels and Survey Vessels. ACP evaluated how many vessels with alternative fuels exist and how many global vessels are planned for construction or modification from 2024-2027 excluding China. ACP found that of the current fleet only 2% of these five vessel types have alternative fuels. Of these five vessel types under construction between 2024-2027 33% will be fueled by alternative fuels. And 7% of these vessels under modification will have the capacity to use alternative fuels. In total that means only 5% of the global market (excluding China) of these five vessel types will be fueled by alternative fuels. As offshore wind ambitions grow in both Europe the U.S. and other markets these vessels will be in short supply. With vessel availability already a challenge for U.S. projects pushing developers to only hire 5% of available vessels places undue burden on projects and is infeasible.[See original attachment for table titled Alternate Fuel Available by Supply Type]AMMMs AQ-2 encourages lessees to replace combustion engines with zero-emissions technology (fuel cell-electric or battery-electric) if feasible for vessels equipment and vehicles engaged in activities on the OCS. Similar to AQ-1 requiring a technical and/or economic feasibility analysis for not using these vessels places an undue burden on developers because of the lack of these vessels in the market both now and in future construction trends. ACP did a similar analysis for the availability of ESS and Shore Power capability of the same 5 representative vessel types in the current market and under construction and modification between 2024-2027. In the current market 5% of vessels have ESS capability 21% of those under construction and 10% of those under modification excluding China. In total looking at current supply and vessels under construction and modification 5% of vessels will have ESS capability.[See original attachment for table titled ESS]Shore power capacity is even less common. Current vessel availability with shore power is 1% of the global market. 4% of vessels under construction 2024-2027 will have	

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	shore power and 7% of vessels under modification. In total in 2027 only 2% of these 5 representative vessels will have shore power capacity.[See original attachment for table titled Shore Power]A programmatic NEPA review focused on a specific region is not the appropriate vehicle to test out new measures and receive feedback from stakeholders on feasibility. As demonstrated above these measures are infeasible unreasonable and requiring each lessee to prove their infeasibility during the project specific COP review places an undue burden on the industry. The onus should not be on the industry to justify why a measure is infeasible but instead the agency should demonstrate that the AMMMs result in reduced impacts. These measures should be removed prior to the publication of the Final PEIS.	
BOEM-2024-0001-0469-0018	Measure AQ-1 addresses developing technologies in a more environmentally protective way but still stops short of alleviating the threat of sulfur hexafluoride ("SF6"). SF6 is an extremely potent greenhouse gas used in the switchgear of wind turbines with 23500 times the global warming potential of carbon dioxide. [Footnote 66: ENV'T PROT. AGENCY & EASTERN RSCH. GRP. ASSESSMENT OF THE USE OF SULFUR HEXAFLUORIDE (SF6) GAS INSULATED SWITCHGEARS (GIS) WITHIN THE OFFSHORE WIND SECTOR 3 (Aug. 24 2023)] The AMMM measure requires lessees to evaluate the feasibility of using an alternative gas and states that lessees should use alternatives to the extent feasible. [Footnote 67 NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 appx. G at G-3.] If the lessee finds that alternatives are not feasible the lessee would be required to provide a written explanation to BOEM supported by a technical feasibility analysis. [Footnote 68 Id.] COA takes issue with the last provision of the mitigation measure that BOEM "may consider" a monitoring and mitigation plan for SF6 in the event that it is used. [Footnote 69 Id.] Although multiple companies are endeavoring to develop alternatives to SF6 there are not yet widely available commercial alternatives. [Footnote 70 ENV'T PROT. AGENCY & EASTERN RSCH. GRP. supra note 66 at 12-19.] Therefore it is likely that SF6 will still be used for the six New York Bight projects so the industry must have stronger requirements to minimize monitor and mitigate SF6 if commercial alternatives remain	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-1 is now included as an RP in the PEIS. BOEM proposes the use of sulfur hexafluoride–free technology with the caveat of feasibility.

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	infeasible. BOEM should be required to implement a minimization monitoring and mitigation plan rather than having the discretion to decide to consider a plan as well as the discretion to decide to implement one after consideration.	
BOEM-2024-0001-0439-0026	Measure ID: AQ-1 Measure Name: Using a substitute insulator gas in the switch gears and transmission systems to the maximum extent possible Description: Lessees must evaluate the feasibility of using non-SF6 switchgear and shall provide the evaluation to BOEM for review. To the maximum extent feasible Lessees should use a substitute insulator gas rather than SF6 in the switchgear and transmission systems. If the Lessee determines using non-SF6 switchgear is infeasible then the Lessee will provide written justification of this determination to BOEM. Any instances where the Lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE. If non-SF6 switchgear is determined to be technically infeasible BOEM may consider requirements for SF6 monitoring and leak detection. Category [Footnote 1: G = Measure constitutes new guidance and could not be implemented through terms and conditions of plan approval D = Measure is duplicative of existing laws or processes J = Measure is outside BOEM's jurisdiction T/E = Measure is technically and/or economically infeasible V = Voluntary measure B = Measure puts an undue burden on industry.]: D T/E JACP Comment: This requirement is duplicative of the OCS air permit process and should be removed. Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of significant thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and the regulations of the Corresponding Onshore Area. This includes SF6 emission' from switchgear located on the WTGs and ESPs. EPA's top-down BACT approach is typically used to determine BACT emission limits for SF6 in switchgear. The top-down BACT analysis consists of these five basic steps: (1) Identify all control technologies; (2) Eliminate technically infeasible options; (3) Rank remaining control technologies by effectiveness; (4) Evaluate most effective controls	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-1 is now included as an RP in the PEIS. BOEM proposes the use of sulfur hexafluoride–free technology with the caveat of feasibility.

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	(taking into account energy environmental and economic impacts) and document results; and (5) Select the BACT. As part of this process the applicant will evaluate the technical and economic feasibility of alternatives to the use of SF6 switchgear. The BACT emission limits are then specified in the OCS Air Permit. As such EPA is responsible for reviewing and concurring with an applicant's justification for why non-SF6 switchgear is technically and/or economically infeasible for the WTGs and ESPs through the BACT process. The PEIS lists BOEM and BSEE as the anticipated enforcing agencies for this and other air quality AMMMs. As described on BOEM's website "BOEM has jurisdiction over Outer Continental Shelf (OCS) air emissions in the Gulf of Mexico west of 87.5 degrees West longitude (off the coasts of Texas Louisiana Mississippi and Alabama). BOEM also has jurisdiction over OCS air emissions within the Chukchi and Beaufort Seas in Alaska according to the Consolidated Appropriations Act of 2012. In all other OCS areas the EPA has jurisdiction as mandated by Section 328 of the CAA." Therefore emissions on the OCS from the construction and operation of offshore wind projects in the New York Bight lease areas are regulated through EPA's OCS Air Permit process under the OCS Air Regulations (40 CFR Part 55). These additional air quality measures are duplicative of current EPA air permit processes and with BOEM and BSEE review and concurrence will lead to confusion with multiple determinations and approvals that may be conflicting.SF6-containing equipment at onshore substations will need to comply with state regulations. For example NYSDEC is proposing a new regulation 6 NYCRR Part 495 "Sulfur Hexafluoride Standards and Reporting." The proposed regulation includes a program to phasedown the use of SF6 in gas insulated equipment used by the electricity sector an emissions limit for gas insulated equipment owners limitations on the use of SF6 and reporting requirements for certain users and suppliers of SF6 and other fluorinated greenhouse gases. As there are already laws and processes in place for evaluation of the use of SF6 BOEM should remove this requirement.Non-SF6 systems would increase the size complexity and cost of several project assets. The majority of the systems being considered for NY Bight projects reaching COD in 2030 have SF6	

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	switchgears. The lack of information guidance or framework for what quantifies and qualifies as technically or economically infeasible is of concern. This demonstration is the responsibility of individual developers through the OCS air permit process.	
BOEM-2024-0001-0422-0020	AQ-1 - Using a substitute insulator gas in the switch gears and transmission systems to the maximum extent possible AQ-2 - Cleaner fuels for vessels equipment and vehicles engaged in activities on the OCSAQ-3 Electrification of vessels equipment and vehicles engaged in activities on the OCS Comment #18 on AQ-1 2 and 3These three air quality topics are applicable to the U.S. offshore wind industry as a whole are not necessarily project-specific and would benefit from a more global analysis. Therefore Attentive Energy urges BOEM to seek an industry-wide response to the evaluation of these three AMMMs. A single analysis of each AMMM or one joint analysis of all three AMMMs would establish an industry baseline that could then be periodically updated as opportunities for improvement become available. The baseline could also be used by developers as the basis of any required technical feasibility analysis. A baseline analysis(es) like this would be more efficient and timely for all projects and BOEM. If desired BOEM could seek support from an offshore wind energy group such as American Clean Power to assist with the development of these analyses.	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-1 through AQ-3 are now included as RPs in the Final PEIS that include a caveat for feasibility concerns. While an industry-wide analysis would establish a comprehensive baseline for these RPs, BOEM believes the current approach is better suited to the immediate needs of the proposed project(s) regarding location-specific conditions, construction schedules, and project-specific requirements. BOEM acknowledges the benefit of this analysis and would consider this analysis as a part of its technical feasibility process.
BOEM-2024-0001-0436-0014	d. Technical and Economic Feasibility Invenergy has confirmed that some of the new AMMMs presented in the Draft PEIS are not technically or economically feasible and therefore not appropriate for consideration as part of alternatives. 40 CFR 1508.1(z). For example AQ-2 (Cleaner fuels for vessels equipment and vehicles engaged in activities on the OCS) encourages lessees to replace diesel fuel and marine fuel oil with alternative fuels such as natural gas propane or hydrogen to the extent that use of such alternative fuels is feasible and provides emissions reductions. The lessee must evaluate the feasibility of this mitigation measure and provide the evaluation to BOEM for review. Any instances where the lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE. Even with "to the extent feasible" or "voluntary" qualifiers the potential effect of burdensome	Refer to response to comment BOEM-2024-0001-0406-0017. Seasonal closures, such as those referenced in REC-1, are included as an RP. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action. MM-5, which discusses vessel speed restrictions, has been previously applied and remains in the document as an AMMM measure for consideration.

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	analysis to avoid inappropriate application of these AMMMs remains. As drafted these measures shift the burden of proof for feasibility to the developer. As originally conceived the PEIS was scoped to assist the application of AMMMs that are well-supported by PEIS analysis. In evaluating the feasibility of new AMMMs BOEM must consider the individual and cumulative nature of AMMMs to ensure they do not ultimately prohibit or severely limit a lessee's ability to construct operate or maintain projects. For example implementing seasonal closures that force industry to be on the ocean only during certain months could compromise the safety of personnel contractor vessels and other assets and would therefore be infeasible. Further new AMMMs should not be considered in a vacuum. Overly precautionary measures can have the unintended consequence of creating a higher risk for a species through other vectors. For example broad seasonal vessel speed constraints could result in more vessels spending more time on the water thus increasing overall exposure to vessel related risks.	
BOEM-2024-0001-0439-0027	Measure ID: AQ-2 Measure Name: Cleaner fuels for vessels equipment and vehicles engaged in activities on the OCS Description: Lessees are encouraged to replace diesel fuel and marine fuel oil with alternative fuels such as natural gas propane or hydrogen to the extent that use of such alternative fuels is feasible and provides emissions reductions. The Lessee will evaluate the feasibility of this mitigation measure and will provide the evaluation to BOEM for review. Any instances where the Lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE. Category: D T/E BACP Comment: This requirement is duplicative of the OCS air permit process and should be removed. As noted above emissions on the OCS from the construction and operation of offshore wind projects in the New York Bight lease areas are regulated through EPA's OCS Air Permit process under the OCS Air Regulations (40 CFR Part 55).Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-2 is now included as an RP in the PEIS, with caveat language included regarding feasibility.

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	Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. As part of the BACT/LAER analysis applicants will assess the feasibility of using lower-emitting fuels (e.g. natural gas/LNG propane or hydrogen) on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why alternative fuels are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. Limits on the fuel types to be used will be specified in the OCS Air Permit. Furthermore several BACT/LAER analyses for offshore wind projects (e.g. Vineyard Wind 1 South Fork Revolution Wind New England Wind 1 New England Wind 2 Empire Wind etc.) have already determined that these alternative fuels (e.g. natural gas/LNG propane or hydrogen) are infeasible. Vineyard Wind 1 explored the possibility of a natural gas-powered vessel but refueling with natural gas could not be supported in the US. Hydrogen's use for marine engines is a novel technology and the production/ supply of hydrogen needed to support marine vessels does not exist in the US. Requiring developers to use alternative fuels would severely limit project feasibility since the supply chain for vessels both current and new builds would be constrained to very few vessels globally. Vessel shortages are already a major burden for the offshore wind industry and creating additional requirements that the existing fleet cannot meet will exacerbate this burden. The Jones Act fleet already has a hard time competing with foreign vessels because shipbuilding in the US cost more than double what it is overseas. This AMMM poses regulatory overreach specifically on the offshore wind industry when other offshore industries such as oil and gas do not face these requirements. The International Maritime Organization regulates vessel air emissions via MARPOL Annex VI and others. Offshore wind is using vessels that also operate in oil and gas and if they are held to dissimilar standards they will be even less competitive in the tight vessel market. When oil prices are high offshore wind has a very hard time competing for vessels and will have an even harder time competing for them if subject to more regulations than the oil and gas industry. Further there is a lack of port capability to fuel such vessels. While new vessels that are used for both O&M and construction may be able to take these technologies into account	

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	due to their longer contracts the majority of vessels will not because of short contracts use in dual markets (O&G and OSW) and ship/port design constraints. Requiring a technical and/or economic feasibility analysis for not using these vessels places an undue burden on developers because of the lack of these vessels in the market both now and in future construction trends. While there are over 25 different types of vessels [Footnote 2: https://cleanpower.org/resources/offshore-wind-vessel-needs/] needed to construct and maintain an offshore wind project ACP did an analysis of 5 types of vessels that provide a good representation of the vessel size and work scope across the industry including Crew Transfer Vessels Heavy Lift Vessels Rock Installation vessels Service Operation Vessels and Survey Vessels. We looked at the global fleet of these vessels excluding China. We also looked at the current global fleet and vessels planned for construction or modification from 2024-2027. AMMMs AQ-2 encourages lessees to replace diesel fuel and marine fuel oil with alternative fuels. ACP found that of the current fleet only 2% of these five types vessels have alternative fuels. Of these five types vessels under construction between 2024-2027 33% will be fueled by alternative fuels. And 7% of these vessels under modification will have the capacity to use alternative fuels. In total only 5% of the global vessel market in 2027 will be fueled by alternative fuels. As offshore wind ambitions grow in both Europe the U.S. and other markets these vessels will continue to be in short supply for the NYB projects. With vessel availability already a challenge for U.S. projects pushing developers to only hire 5% of available vessels places undue burden on projects.	
BOEM-2024-0001-0440-0003	III. The PEIS Should Analyze - Not "Adopt" - AMMMs for the Bight Projects BOEM has characterized the "Proposed Action" for the draft PEIS as "the adoption of programmatic AMMM measures that BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective." This framing of the PEIS [Footnote 10: Bight Draft PEIS at 14.] is problematic for a number of reasons. In the first instance by purporting to adopt default AMMMs applicable to all Bight projects BOEM appears to be using the PEIS as	BOEM has clarified the alternatives and reviewed all comments on AMMM measures and revised AMMM measures, as appropriate. Refer to response to comment BOEM-2024-0001-0361-0004 for additional clarification on the purpose of Alternative B and revisions to Alternative C, and refer to response to comment BOEM-2024-0001-0406-0017 regarding BOEM's review and updating of AMMM measures and identifying RPs. AQ-2 and AQ-3 are now included as RPs in the PEIS.

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	a rulemaking mechanism without satisfying the rulemaking requirements of the Administrative Procedure Act (APA) and other authorities governing agency rulemakings. The APA defines a "rule/ in pertinent par(as "an agency statement of general or particular applicability and future effect designed to implement interpret (or prescribe law or policy." [Footnote 11: 5 USC 551.] AMMM measures that BOEM "would require as conditions of approval" [Footnote 12: Bight Draft PEIS at 14.] across the Bight projects meets the APA's definition of a "rule." The APA requires agencies to publish notice of a proposed rulemaking in the Federal Register and this notice must include a reference to the legal authority under which the rule is proposed as well a statement of the terms or substance of the proposed rule or a legally adequate description of the subjects and issues involved. [Footnote 13: 5 USC 553(6)] The brief "notice of availability" of the draft PEIS that was published in the Federal Register [Footnote 14: 89 FR 2249 (Jan 12 2024)] does not satisfy the APA's notice requirement for rulemakings and BOEM would not be able to identify a "legal authority" underpinning some of the proposed AMMMs because they fall under the regulatory purview of other agencies. [Footnote 15: Such AMMMs would include those regarding air quality which fall under the EPA's Cleon Air Act authority. Further even where AMMMs might fall within BOEM's authority a programmatic DEIS is not the proper vehicle to adopt terms and conditions of permits.] Beyond the basic requirements of the APA there are several Executive Orders governing federal rulemaking actions that BOEM should comply with before imposing new substantive requirements on the Bight lessees. These Executive Orders include E.O. 12866 and E.O. 13563 which require agencies to minimize regulatory burdens and base regulations on the best available science. The framining of the draft PEIS also risks creating legal vulnerabilities for the project-specific reviews and COP approvals for the Bight projects. This is because by "adopting" AMMMs in the PEIS BOEM would effectively establish default AMMMs for the projects and any deviation from those AMMMs in the COP approvals could be subject to litigation risk based on allegations that the record does not support both: (1) that the default AMMM is not warranted or effective and (2) that the	

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	substitute AMMM is warranted and effective. [Footnote 16: To be clear Shell is not suggesting that this would be a valid basis for challenging the project-specific analysis. Rother Shell is simply trying to demonstrate how project opponents might attempt to misuse BOEM's "adoption" of the AMMMs in the PEIS to their advantage.] While this is not an insurmountable hurdle it will require the expenditure of significant time and resources by BOEM consulting agencies and the project developer. This problem is exacerbated by the fact that many of the AMMMs outlined in Appendix G are novel and test the bounds of technical and economic feasibility [Footnote 17: For example AMMMs AQ-2 and AQ-3 pertaining cleaner fuels and/or electrification for vessels equipment and vehicles engaged in activities on the OCS would establish default requirements that ore practically infeasible (for the reasons detailed in the ACP comment matrix) and obligate lessees to justify deviation via submission of a technical feasibility analysis. 17 meaning many deviations from the default AMMMs can be expected. Fortunately BOEM can easily address these problems in the final PEIS by re-framing the proposed action in terms of establishing a baseline environmental analysis for the Bight projects including an analysis (rather than adoption) of programmatic AMMMs that could (but not necessarily would) be applied to the COP approvals depending on the mitigation needs revealed in the project-specific NEPA analysis. Indeed this proposed action would seem to be more consistent with the "objectives" that BOEM set for the PEIS namely:- Analyzing potential impacts if development is authorized in the six NY Bight lease areas.- Analyzing programmatic AMMM measures for the six NY Bight lease areas.- Analyzing focused regional cumulative effects.- Tiering of project-specific environmental analyses. [Footnote 18: Bight Draft PEIS at 15.]If the final PEIS is framed with a focus on these objectives it can avoid the legal issues outlined above while re-orienting the PEIS towards facilitating efficient project-specific reviews.	
BOEM-2024-0001-0439-0028	Measure ID: AQ-3 Measure Name: Electrification of vessels equipment and vehicles engaged in activities on the OCS Description: Lessees are encouraged to replace combustion engines with zero-emissions technology (fuel cell-electric or battery-electric) if feasible. The Lessee will evaluate the feasibility of this mitigation measure	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-3 is now included as an RP in the PEIS, with caveat language included regarding feasibility.

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	and will provide the evaluation to BOEM for review. Any instances where the Lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE. Category: D T/E BACP Comment: This requirement is duplicative of the OCS air permit process and should be removed. As noted above emissions on the OCS from the construction and operation of offshore wind projects in the New York Bight lease areas are regulated through EPA's OCS Air Permit process under the OCS Air Regulations (40 CFR Part 55).Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. As part of the BACT/LAER analysis applicants will assess the feasibility of using inherently lower-emitting practices or designs such as the use of batteries or fuel cells on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why these zero-emission technologies are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. This measure raises the same concerns as vessels with alternative fuels above. However the market for zero emissions technology is even smaller. Overall requiring a technical and/or economic feasibility analysis for not using these vessels places an undue burden on developers because of the lack of these vessels in the market both now and in future construction trends. While there are over 25 different types of vessels [Footnote 3: https://cleanpower.org/resources/offshore-wind-vessel-needs/] need to construct and maintain an offshore wind project ACP did an analysis of 5 types of vessels that provide a good representation of the vessel size and work scope across the industry including Crew Transfer Vessels Heavy Lift Vessels Rock Installation vessels Service Operation Vessels and Survey Vessels. We looked at the global fleet of these vessels excluding China. We also looked at the current global fleet and vessels planned for construction or modification	

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	from 2024-2027. AMMMs AQ-3 encourages lessees to replace combustion engines with zero-emissions technology (fuel cell-electric or battery-electric) if feasible for vessels equipment and vehicles engaged in activities on the OCS. For Energy Storage Systems (ESS) capability 5% of vessels are currently capable 21% of those under construction and 10% of those under modification. In total looking at current supply and vessels under construction and modification in 2027 5% of vessels will have ESS capability. Shore power is even less common. Current vessel availability with shore power is 1% of the global market. 4% of vessels under construction 2024-2027 will have shore power and 7% of vessels under modification. In total in 2027 only 2% of these 5 representative vessels will have shore power capacity. Even for smaller vessels such as CTVs the operational profile of CTVs for US OSW projects does not have a positive outlook for full electrification. Other vessel types which have successfully been outfitted with ESS are utilized on short fixed transits routes with onshore charging points readily accessible on the dedicated route. Availability of charging points charging time and relatively fixed vessel utilization enables the vessel to carry the correctly sized ESS. The operational profile of CTVs requires high flexibility and utilization. A battery ESS with enough capacity to support CTV's needs is infeasible due to weight and volume which is incredibly limited onboard. Even with the inclusion of offshore charging the demands on a CTV are so variable that it can't be assumed that charging time will always be possible. A measure of this type may work as a regional requirement but it does not work as an industry-specific requirement. For example electric tugs are unlikely to be relocated to the east coast for a few months of work when they have an entire regional market in California.	
BOEM-2024-0001-0439-0029	Measure ID: AQ-4 Measure Name: Exhaust aftertreatment for vessels engaged in activities on the OCS Description: Lessees should evaluate on a vessel-specific basis the use of exhaust aftertreatments such as emission control technologies for example scrubbers for SO2 and selective catalytic reduction for NOX. The Lessee will evaluate the feasibility of this mitigation measure and will provide the evaluation to BOEM for review. Any instances where the Lessee believes there is technical (and/or economic) infeasibility	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-4 is now included as an RP in the PEIS, with caveat language included regarding feasibility.

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	must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE. Category: D T/EACP Comment: This requirement is duplicative of the OCS air permit process and should be removed. As noted above emissions on the OCS from the construction and operation of offshore wind projects in the New York Bight lease areas are regulated through EPA's OCS Air Permit process under the OCS Air Regulations (40 CFR Part 55).Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. As part of the BACT/LAER analysis applicants will assess the feasibility of add-on pollution controls (e.g. Selective Catalytic Reduction Selective Non-Catalytic Reduction NOx Adsorber/Scrubber Lean Nox Catalysts Sox Scrubber Diesel Particulate Filter Diesel Oxidation Catalyst etc.) on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why these add-on pollution controls are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. This measure raises the same concerns described above (see AQ-2 and AQ-3) given vessel shortages that are already a major burden for the offshore wind industry and creating additional requirements that the existing fleet cannot meet will exacerbate this burden.	
BOEM-2024-0001-0439-0030	Measure ID: AQ-5 Measure Name: Exhaust aftertreatment for older engines in vehicles and equipment engaged in activities on the OCS Description: Lessees are encouraged to use diesel particulate filters and diesel oxidation catalysts to retrofit older (USEPA Tiers 13) diesel engines if feasible. The Lessee will evaluate the feasibility of this mitigation measure and will provide the evaluation to BOEM for review. Any instances where the Lessee believes there is technical (and/or economic) infeasibility must be supported by a technical feasibility analysis as appropriate for review and concurrence by BOEM and BSEE. Category: D T/E BACP Comment: This requirement is duplicative of the OCS air permit process and should be removed.	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-5 is now included as an RP in the PEIS, with caveat language included regarding feasibility.

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	As noted above emissions on the OCS from the construction and operation of offshore wind projects in the New York Bight lease areas are regulated through EPA's OCS Air Permit process under the OCS Air Regulations (40 CFR Part 55).As noted above emissions on the OCS from the construction and operation of offshore wind projects in the New York Bight lease areas are regulated through EPA's OCS Air Permit process under the OCS Air Regulations (40 CFR Part 55).Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. As part of the BACT/LAER analysis applicants will assess the feasibility of add-on pollution controls (e.g. Selective Catalytic Reduction Selective Non-Catalytic Reduction NOx Adsorber/Scrubber Lean Nox Catalysts Sox Scrubber Diesel Particulate Filter Diesel Oxidation Catalyst etc.) on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why these add-on pollution controls are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. Lessees typically use 3rd party vessels to perform construction. Because these vessels are not owned by the Lessee this condition is not viable to be implemented by Lessee. Further this measure would greatly reduce the projects' ability to find suitable construction vessels. This measure raises the same concerns described above (see AQ-2 and AQ-3) given vessel shortages that are already a major burden for the offshore wind industry and creating additional requirements that the existing fleet cannot meet will exacerbate this burden.	
BOEM-2024-0001-0439-0031	Measure ID: AQ-6 Measure Name: Onshore measures: zero-emissions technologies Description: Lessees are encouraged to require their contractors to use ports equipped with shore power and zero-emissions material-handling equipment and construction firms that offer alternative-fueled or zero-emissions equipment and vehicles. The Lessee may evaluate the feasibility of this mitigation measure and provide the evaluation to BOEM for review. Category: V	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-6 is now included as an RP in the PEIS and has been updated to include language regarding air permitting that is enforced by USEPA and the state.

Comment No.	Comment	Response
	J T/EACP Comment: The PEIS indicates that this measure is voluntary/outside BOEM jurisdiction. Voluntary measures and measures outside BOEM's jurisdiction should not be included in AMMMs. Port authorities with jurisdiction over ports can most appropriately undertake these improvements. A number of port authorities are conducting zero-emissions feasibility studies. This measure would greatly reduce the projects' ability to find suitable ports. In addition Lessees have already committed to utilizing certain ports under their PPA agreements. Offshore Wind ports are already in dire need of basic investments. US. Port infrastructure is largely unable to support offshore wind component manufacturing and deployment and is facing material financing gaps.[Footnote 4: They estimate that the total cost to address the nation's offshore wind port infrastructure gap assuming 2023 construction prices and no financing costs is between $22.5-27.2 billion. Port improvements to accommodate offshore wind need to be prioritized. Electrification of handling equipment would be especially difficult and infeasible at most ports. However new ports are adding electrification as they are more able to bring in the transmission and electricity required to do shore power/cold ironing.	
BOEM-2024-0001-0439-0032	Measure ID: AQ-7 Measure Name: Onshore measures: diesel engine emissions standards Description: Lessees are encouraged to require their contractors to ensure that all diesel engines in vehicles and equipment meet USEPA Tier 4 emissions standards. The Lessee may evaluate the feasibility of this mitigation measure and provide the evaluation to BOEM for review. Category: D V JACP Comment: The PEIS indicates that this measure is voluntary/outside BOEM jurisdiction. Voluntary measures and measures outside BOEM's jurisdiction should not be included in AMMMs. This measure contains contradictory statements the "Anticipated Enforcing Agency" column notes that this is outside BOEM jurisdiction while the measure states that the evaluation should be provided to BOEM for review. These emission sources are temporary in nature and should be regulated through EPA non-road and vehicle emission standards.	Refer to response to comment BOEM-2024-0001-0406-0017. AQ-7 is now included as an RP in the PEIS and was updated to include language regarding air permitting that is enforced by USEPA and the state. While this is outside of BOEM jurisdiction, the use of these types of engines is beneficial to review for all phases of the project.

Table P.5.23-7. Responses to Substantive Comments on Mitigation and Monitoring—Navigation and Vessel Traffic (NAV)

Comment No.	Comment	Response
BOEM-2024-0001-0324-0004	As NASCA has repeatedly explained in its comments submarine cables are critical infrastructure supporting vital economic societal and national security needs. [Footnote 6: See NASCA 2018 Comments at 4. See also Comments of NASCA Docket No. BOEM-2022-0072 (filed Dec. 16 2022) ("NASCA 2022 Mid-Atlantic Comments") at 4-6.] NASCA does not doubt that renewable energy projects similarly constitute critical infrastructure and that uncoordinated development activities would be harmful to both. [Footnote 7: NASCA 2022 Mid-Atlantic at 9-10; Comments of NASCA Docket No. BOEM-2023-0034- 0001 (filed Aug. 31 2023) at 2.] This is underscored by PEIS Figure 3.6.7-5 which shows the significant submarine cable infrastructure already deployed along with New York Bight and other BOEM lease areas. What this figure does not show is the anticipated export transmission line infrastructure. According to the PEIS for the six New York Bight projects BOEM anticipates "44 offshore export cables totaling 1.772 miles (2852 kilometers) and 1582 miles (2546 kilometers) of interarray cables across the NY Bight lease areas." [Footnote 8: PEIS at ES-8.] Deployment of such extensive export infrastructure across lease areas throughout the New York Bight will require carefully planned and coordinated siting activity to ensure the safe siting operating and maintenance of both new and existing infrastructure. Yet BOEM identifies the impact of proposed leasing activities on existing cables as minimal and proposes no programmatic avoidance minimization mitigation and monitoring ("AMMM") mechanisms to address impact. [Footnote 9: PEIS at Tables ES-2 and 2-4 at 3.6.7 pp. ES-12 & 2-37; Section 3.6.7.] Instead BOEM notes that the "potential for overlap of submarine cables in the geographic analysis area will be evaluated during the future COP NEPA stage."	BOEM COP guidelines outline steps lessees should take to coordinate with existing seabed users, including submarine cables, according to International Cable Protection Committee recommendations (referenced in RP MUL-23). BOEM has required lessees to provide cable crossing agreements, or evidence of attempts to reach cable crossing agreements, as part of previous COP T&Cs. Due to existing COP guidelines, coordination with existing cable owners and operators will be continued at the COP-specific NEPA stage. BOEM regulations (30 CFR 585.200(b)) state, "A lease issued under this part confers on the lessee the rights to one or more project easements without further competition for the purpose of installing gathering, transmission, and distribution cables; pipelines; and appurtenances on the OCS as necessary for the full enjoyment of the lease." BOEM cannot limit a lessee's right to a project easement for submarine cables. At cable crossings, both the existing infrastructure and the proposed transmission cable(s) must be protected. The protection and crossing method would be determined on a case-by-case basis. Additionally, BOEM encourages the telecommunication cable industry to coordinate with BOEM prior to installing additional cables, as well, to avoid potential conflicts. The Final PEIS includes RP MUL-18, which encourages lessees to utilize shared transmission corridors, which could reduce the number of cable approaches needed for the six NY Bight lease areas.
BOEM-2024-0001-0324-0006	Accordingly NASCA urges BOEM to include in its final PEIS an AMMM directed at requiring early coordination with existing submarine cable infrastructure pursuant to best practices and guidelines. At the same time NASCA urges BOEM to develop and publicize best practices and guidelines based on internationally-accepted recommendations for coordination between the submarine cable	Thank you for your comment. Refer to response to comment BOEM-2024-0001-0324-0004.

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	and renewable energy industries (to include spatial separation guidelines and the need for proximity and cable crossing agreements). [Footnote 11: NASCA 2022 Mid-Atlantic at 12-18 and 22-24 (arguing that well-established spatial separation recommendations should be used to develop guidelines for coordination between the submarine cable and renewable energy industries including the recommendations of the International Cable Protection Committee and the Federal Communications Commission's Communications Security Reliability and Interoperability Council).] At a minimum BOEM should direct potential licensees to existing recommendations such as those developed and published by the International Cable Protection Committee ("ICPC") in particular ICPC's recommendation No. 2 Cable Routing and Reporting Criteria and Recommendation No. 3 Telecommunications Cable and Oil Pipeline/Power Cables Crossing Criteria. [Footnote 12: For more information on these recommendations please refer to the ICPC's website www.iscpc.org.] In sum NASCA believes that expressly identifying submarine cable infrastructure and incorporating coordination criteria in the final PEIS will go a long way to ensuring efficient and safe installation operation maintenance and repair of both submarine telecommunications cable and offshore wind infrastructure.	
BOEM-2024-0001-0370-0001	The USCG does not oppose the Proposed Action Alternative and recommends all Proposed Action avoidance minimization mitigation and monitoring (AMMM) measures pertaining to Navigation and Vessel Traffic be made mandatory. Additionally the USCG offers the following recommendations. Turbine Layout Proposed Action AMMM measures for consistent turbine layout marking and lighting incorrectly states turbines should have [Underline: one of the two lines] of orientation per lease area spaced at least 1 nautical mile (nm) apart to support navigation safety and Search and Rescue (SAR). Per Navigation and Vessel Inspection Circular (NVIC) 02-23 the Coast Guard recommends each windfarm be organized in straight rows and. columns creating a grid pattern consisting of two lines of orientation with at least 1 nm between turbines. Each windfarm's bathymetric circumstances are different and spacing of less than 1 nm may be unavoidable but programmatic AMMM measures applied	MUL-25 is now an RP. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs. MUL-25 has been revised to be in alignment with Navigation and Vessel Inspection Circular 02-23, in which USCG recommends that “each windfarm be organized in straight rows and columns, creating a grid pattern consisting of two lines of orientation.” Navigation and Vessel Inspection Circular 02-23 does not create a requirement for 1-nautical-mile spacing between turbines.

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	throughout the NYB should align with NVIC 02-23. Deviations from this guidance should be assessed during project-specific environmental impact assessments and Navigation Safety Risk Assessments (NSRA) on a case-by-case basis for each lease area.	
BOEM-2024-0001-0422-0010	MUL-25 Consistent turbine layout markings and lighting Comment #8 on MUL-25 Attentive Energy requests maintaining in this AMMM the existing ability to allow developers to coordinate with the U.S. Coast Guard ("USCG") the National Oceanic and Atmospheric Association BOEM and other federal agencies to address multiple priorities and achieve a layout and spacing that incorporates necessary site conditions and offtake agreements while respecting navigational and search and rescue safety. Rigorous analyses of each offshore wind project are conducted through the preparation of Navigational Safety Risk Assessments and during the individual project COP and EIS process. This AMMM provides less flexibility to allow for project-specific conditions than what has been communicated by the USCG in recent interactions or than by what has been displayed by several of BOEM's recent COP approvals. In addition the reference to the layout "having one of the two lines of orientation" should be modified to allow for projects that have more than two lines of orientation as USCG has made it clear that the guidelines in its NVIC 02-23 language are not meant to be limited to just two lines. Attentive Energy does not believe it is appropriate to use the Massachusetts and Rhode Island Port Access Route Study rather than the more regionally appropriate Seacoast of New Jersey Including Offshore Approaches to Delaware Bay Delaware Port Access Route Study and Northern New York Bight Port Access Route Study. Attentive Energy requests that BOEM state explicitly that a 1nm line of orientation is a recommendation not a requirement as it needs to comport with the requirement that every EIS alternative be technically and economically feasible. In coordination with the USCG other previous offshore wind projects have not included a 1nm line of orientation in their COPs and have received COP approval. These approvals indicate that there are other workable layouts that can both allow for safe navigation and search and rescue operations while also respecting energy output obligations.	Please refer to response to comment BOEM-2024-0001-0370-0001. MUL-25 has been reclassified as an RP in the Final PEIS. BOEM does not intend to limit the number of lines of orientation within a wind farm under MUL-25. Rather, BOEM is recommending that one line of orientation be no less than 1.0 nautical mile for USCG search and rescue (SAR) operations. Project-specific layouts will be analyzed during subsequent NEPA analysis based on information provided in the COP.

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BOEM-2024-0001-0423-0004	B. AMMMs of Greatest Concern Beyond the structural and systemic issues with the PEIS process and the draft document there are certain AMMMs discussed below that we highlight as being particularly problematic. [bold: MUL-25] states that [italicized: "Turbines should have one of the two lines of orientation per lease stipulation spaced at least 1 nautical mile (1.9 kilometers) apart to support navigation safety and Search and Rescue. The spacing would also preserve structure-free areas to facilitate seabird passage and fishing operations."] The NY Bight lease areas have been sited outside of shipping routes via the five- year robust lease area identification process led by BOEM ahead of the lease auction. The vessels that will transit through the wind farm areas are primarily commercial fishing vessels and pleasure craft. Large commercial traffic will avoid the lease areas per the U.S. Coast Guard's (USCG) designation of offshore fairways for navigation around the NY Bight lease areas. Ocean Winds will work with USCG through the Navigation Safety and Risk Assessment (NSRA) process as all other developers have done to evaluate potential changes in navigation safety for our lease areas. Additionally there is little scientific support for the supposition that wider turbine spacing would assist in seabird passage. Applying the same requirement without considering if the affected lease areas are or are not adjacent to other lease areas is deeply inappropriate. This is of special interest to OW given that our Bluepoint Wind lease area (OCS-A 0537) is effectively an "island" and is not adjacent to any other lease area. Application of a uniform grid pattern to such a lease area would not allow for consistent navigation paths between lease areas given the stretches of open ocean between the other NYB lease areas and Bluepoint. This AMMM would have a significant impact on ratepayer cost due to the need to remove turbine positions to accommodate wider spacing and it would only marginally benefit a small number of ocean users operating in the lease areas. The NSRA process and the extensive stakeholder consultations throughout the larger permitting process will address the concerns of all ocean users without lowering the clean energy output of these projects and increasing the cost to customers by imposing a one-size-fits-all approach.	Please refer to response to comment BOEM-2024-0001-0422-0010. Current guidance states that all vessels, including large commercial vessels, need to be able to navigate safely in and around wind farms.

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BOEM-2024-0001-0439-0072	Measure ID: MUL-25 Measure Name: Consistent turbine layout markings and lighting Description: Lessees should employ consistent turbine grid layouts spacing markings and lighting among lease areas to minimize navigational hazards and facilitate other ocean uses such as fishing and recreational activities. Turbines should have one of the two lines of orientation per lease stipulation spaced at least 1 nautical mile (1.9 kilometers) apart to support navigation safety and Search and Rescue (SAR). This recommended spacing is based on the USCG's 2020 Massachusetts and Rhode Island Port Access Route Study (https://www.navcen.uscg.gov/sites/default/files/pdf/PARS/FINAL_REPORT_PARS_May_14_2020.pdf). The spacing would also preserve structure-free areas to facilitate seabird passage and fishing operations. Also per lease stipulations adjacent lease areas that do not adopt the same layout must have an additional setback from shared borders. In accordance with BOEM lighting and marking guidelines and USCG and FAA lighting and marking requirements Lessees must ensure that all structures are properly marked and lighted. Previously Applied as a COP T&C: Category: G DACP Comment: Other COPs have already been approved with spacing that is less than 1nm x 1nm to meet project purpose and need and to provide the maximum benefit of efficient electricity production for ratepayers. Smaller spacing is also very common in Europe. Rigorous analyses of each offshore wind project are conducted through the preparation of NSRAs and during the individual project NEPA process. This measure locks developers into something that the USCG has already said they can work with developers on project-by-project. This measure is guidance and should not duplicate USCG guidance and USCG review of site-specific conditions assessed in the NSRA and through their participation in the NEPA process. The recent NVIC 02-23 (note that reference to guidance from Rhode Island and Massachusetts should be removed) only recommends 1x1 nm. Furthermore this measure is in conflict with a number of leases that allow for alignment across adjacent leases. A qualifying statement would need to be added: "unless otherwise stipulated in a lease "The USCG is currently conducting a NPRM on an Atlantic Coast PARS that is hemming in OSW projects. This measure would further	Please refer to response to comment BOEM-2024-0001-0422-0010. Although the Rhode Island/Massachusetts study is outside of the NY Bight lease areas, the study recommends spacing necessary for SAR operations, which is not location specific.

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	constrain the ability to site clean renewable energy to meet federal and state climate change goals.	
BOEM-2024-0001-0452-0007	C. Turbine Layouts Not Fully Analyzed The proposed turbine layouts in the RPDE include a minimum 0.6 x 0.6 nm separation: spacing which the fishing industry has stated for years is incompatible with operations especially for mobile fisheries and which poses significant risks to transit. Unfortunately the proposed AMMMs MUL-23 and MUL-25 with spacing of 1x1 nm on two lines of orientation set to address these concerns do not achieve the intended goal. The draft PEIS demonstrates that these AMMMs have little utility by stating "(t)hese measures however are unlikely to change the impact rating of the IPF Therefore these potential impacts are unlikely to differ under Alternative C as compared to Alternative B." [Footnote 15: Draft PEIS p. 2-20.] The PEIS should not draw unsupported conclusions especially for measures that have been identified as fishing experts as potentially effective in reducing risk. Failure to even analyze measures that would reduce impacts to fisheries at this stage in the permitting process prior to COP submission is without justification.	Thank you for your comment. The 0.6- by 0.6-nautical-mile spacing was for purposes of analysis in the RPDE for the PEIS and represents the maximum buildout, or maximum number of turbine positions considered in the RPDE. Actual WTG layouts will be determined at the COP-specific NEPA stage and analyzed during project-specific NEPA analysis. Additionally, an NSRA will be submitted with each COP.
BOEM-2024-0001-0352-0006	Recommendations for implementation of AMMM measures. We support implementation of the following AMMM measures as described in Appendix G. These AMMM measures should be implemented at this stage rather than deferring to later project-specific analyses. We have not commented on every AMMM measure in Appendix G. Other listed AMMM measures may also be useful and appropriate but are not directly relevant to avoiding mitigating minimizing or monitoring effects on fisheries or fisheries resources and their habitats. COMFIS-1: Compensation for gear loss and damage. COMFIS-2: Scour and cable protection. COMFIS-5: Fisheries survey guidelines. COMFIS-6: Fisheries compensatory mitigation. MUL-1: Marine debris awareness and elimination. MUL-4: Final cable protection in hardbottom. MUL-5: Low noise best practices. MUL-7: Vessel noise reduction guidelines. MUL-8: Gear identification. MUL-9: Lost survey gear MUL-14: UXO avoidance. MUL-19: Post-installation cable monitoring. MUL-20: Soft start for impact pile-driving. MUL-25: Consistent turbine layout markings and lighting In particular we strongly support requiring turbines to have	Thank you for your comment in support of the PEIS AMMM measures. BOEM notes that, based on comments on the Draft PEIS, all AMMM measures have been reviewed, which resulted in some revisions. In addition, BOEM reclassified several AMMM measures as RPs. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information. Regarding the boulder threshold size in NAV-1 (now MUL-40), the threshold size of 2 meters was selected based on limitations of existing technology for boulder picking and relocation plow.

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	"one of the two lines of orientation per lease stipulation spaced at least 1 nautical mile (1.9 kilometers) apart to support navigation safety and Search and Rescue" as recommended in the U.S. Coast Guard's 2020 Massachusetts and Rhode Island Port Access Route Study. We are pleased that BOEM is considering using this study in this way. MUL-26: Monitoring plan. MUL-27: Minimize sediment disturbance. MUL-28: Inadvertent returns plan and drilling fluids. MUL-21: Sampling gear removal between seasons. MUL-38: Noise mitigation plan. MUL-39: Electrical shielding on underwater cables. NAV-1: Boulder relocation reporting - We support this AMMM measure; however the final PEIS should indicate how the threshold size of 6.6 ft (2 m) was selected. Relocation should be reported for all boulders that would constitute a hang that might entangle fishing gear causing a safely issue. NAV-3: Cable placement for navigation and safety OU-7: Federal survey mitigation program. STF-2: Sea turtle/Atlantic sturgeon identification and data collection - This AMMM measure does not directly impact Council-managed fisheries. However the Councils are required to ensure that fishery management measures will not have adverse impacts on protected species; therefore we support gathering data that will be useful in assessing protected species populations.	
BOEM-2024-0001-0439-0081	Measure ID: NAV-1 Measure Name: Boulder relocation reporting Description: The Lessee must provide USCG NOAA navigational software companies and the local harbormaster with a comprehensive list and shapefile of positions and areas to which boulders >6.6 feet (>2 meters) will be relocated (latitude longitude) at least 60 days prior to boulder relocation activities. Previously Applied as a COP T&C: Category: T/EACP Comment: It is not technically feasible to provide exact locations of relocated boulders in advance of operations. Sea state seabed and logistical conditions arise offshore that will affect exact locations. The boulder plan (measure BEN-1) can provide planned areas but long/lats cannot be provided until after operations. Developers normally update BOEM of boulder relocation within 60 days of completion not in advance. This is not a navigation issue and it is unclear why it is being listed as a "Nav" measure. NOAA will not chart small boulders they would say ''rocky'' instead. In addition Lessees should not be required to	The AMMM measure is requiring planned areas and planned locations for the relocated boulders in advance, as there are limitations to where they can and cannot be moved to. BOEM has edited the text of NAV-1 (now MUL-40) to remove reference to software companies and local harbormasters.

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	distribute navigational software companies. There are also no harbormasters for these lease areas.	
BOEM-2024-0001-0423-0022	Navigation [bold: NAV-1] would require reporting to BOEM 60-days in advance where a lessee plans to move a boulder. The current standard is to report where boulders are moved 60-days after relocation. It is not clear in the Draft PEIS what impact justifies NAV-1 in the first place and why the current standard is insufficient and needs to be abandoned in lieu of a far more onerous and costly restriction. NAV- 1 if implemented would have the effect of stopping work every time a boulder needed to be moved yet lessees would need to continue to pay for vessel and equipment use during that period or risk losing their use to another customer. Ocean Winds believes this presents an unworkable hurdle and is not conducive to a reasonable approach.	The AMMM measure language aligns with the current standard and would require planned areas and planned locations for the relocated boulder in advance, as there are limitations to where they can and cannot be moved to. This measure has been applied in previous COP approvals and will remain an AMMM measure in the PEIS. BOEM has revised the AMMM measure to remove reference to software companies and local harbormasters.
BOEM-2024-0001-0406-0023	vi. Measures That Should Be Reserved for Guidance Many of the proposed AMMM measures in the Draft PEIS are not true mitigation measures and would be more appropriate to incorporate into BOEM's guidelines. Rather than use the PEIS process as a substitute for guidance BOEM should instead work with offshore wind lessees on a process to inform and amend the appropriate guidance documents. Examples of proposed AMMM measures that fall under this category include all of the measures flagged as vague and unenforceable in section IV.b.ii above as well as the following: COMFIS-4 which appears to be taken verbatim from Sections B and C of BOEM's draft Fisheries Mitigation Guidance. [Footnote 11: DRAFT Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585 (June 2022) available at https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf.] COSW respectfully recommends that rather than including the entirety of the draft Fisheries Mitigation Guidance in the PEIS by splitting it among several AMMM measures it would be more appropriate to finalize that guidance. NAV-2 which would require the wholesale adoption of the U.S. Coast Guard's (USCG) Marine Planning Guidelines (MPGs) "[i]n developing their initial COP or as part of subsequent updated versions." The MPGs are by their own	After further consideration, BOEM has removed NAV-2, as it is already covered under BOEM's Notice of Intent (NOI) checklist (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/BOEM%20NOI%20Checklist.pdf). Lessees are encouraged to follow the guidance within USCG's Navigation and Vessel Inspection Circulars at the COP-specific NEPA stage.

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	terms guidance intended to be applied on a case-by-case basis. [Footnote 12: See GUIDANCE ON THE COAST GUARD'S ROLES AND RESPONSIBILITIES FOR OFFSHORE RENEWABLE ENERGY INSTALLATIONS (OREI) ON THE OUTER CONTINENTAL SHELF (OCS) NVIC 02-23 (October 2023) Enclosure 4 available at https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/5ps/NVIC/2020/2023/OREI%20NVIC%202023_V2_29NOV2023.pdf] Any application of the MPGs to COP review should likewise be accomplished through BOEM guidance. [Footnote 13: We also note that mandatory application of the MPGs could circumvent notice and comment rulemaking under the APA see Section II.b above and may result in the commercially significant loss of wind turbine positions adjacent to shipping lanes.]	
BOEM-2024-0001-0422-0015	NAV-2 Marine Planning Guidelines Comment #13 on NAV-2 Attentive Energy recommends this AMMM be modified by adopting language stipulating adhering to the Marine Planning Guidelines "as reasonable and practicable" as not all measures in the guidelines could be feasibly adopted by every offshore wind project. Further BOEM should clarify what is meant by a "USCG-recognized maritime expert" or remove such reference. To date NVIC 02-23 does not define identify or represent USCG-recognized maritime experts. It is inappropriate for BOEM to require developers to adopt the NVIC 02-23 when it is a guidance document containing recommendations that are further evaluated in the NSRA and individual project NEPA processes.	After further consideration, BOEM has removed NAV-2, as it is already covered under BOEM's NOI checklist (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/BOEM%20NOI%20Checklist.pdf). Lessees are encouraged to follow the guidance within USCG's Navigation and Vessel Inspection Circulars at the COP-specific NEPA stage.
BOEM-2024-0001-0439-0082	Measure ID: NAV-2 Measure Name: Marine Planning Guidelines Description: In developing their initial COP or as part of subsequent updated versions Lessees will adopt the Marine Planning Guidelines (NVIC 02-23 Enclosure (3) or applicable current version: https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/5ps/NVIC/2020/2023/OREI%20NVIC%202023_ FINAL_05OCT2023.pdf?ver=2FtgA6VSQw3TzFDIObhmgQ%3d%3d where applicable as established by USCG to ensure navigational safety. Additionally Lessees will work closely with USCG and USCG-recognized maritime experts to improve procedures for evaluating and regulating safety at sea including through adjustments to the Port Access Route Study process. Previously Applied as a COP T&C:	After further consideration, BOEM has removed NAV-2, as it is already covered under BOEM's NOI checklist (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/BOEM%20NOI%20Checklist.pdf). Lessees are required to follow USCG's Navigation and Vessel Inspection Circulars at the COP-specific NEPA stage.

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	Category: D GACP Comment: It is inappropriate for BOEM to require developers to adopt the NVIC 02-23 when it is a guidance document containing recommendations that are further evaluated in the NSRA and individual project NEPA processes. It is also meant to be continually updated. ACP and the USCG are currently discussing 58 issues with NVIC 02-23. One example is that NVIC 02-23 contains problematic setback requirements that should not be required after lease execution. The PEIS intends to analyze measures that can be approved as terms and conditions of plan approval for individual project specific COPs. Since this measure dictates how a COP should be developed by its very nature it could not be implemented through terms and conditions of COP approval. NVIC 02-23 is only focused on the offshore wind industry. Are other maritime industries such as oil and natural gas required to comply with similar guidance?	
BOEM-2024-0001-0406-0018-a	NAV-3 which would require lessees to "avoid unfavorable cable placement." Notwithstanding the list of examples the term "unfavorable" is extremely vague at best and incredibly expansive at worst opening lessees up to unchecked liability and inviting potentially excessive agency discretion. Moreover cable routing is planned through COP development and is not appropriate as a condition of COP approval.	Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. NAV-3 has not been previously applied in previous COP approvals and was analyzed in Sub-alternative C2. Cabling will be analyzed on a case-by-case basis in consultation with USCG.
BOEM-2024-0001-0439-0083	Measure ID: NAV-3 Measure Name: Cable placement for navigation and safety Description: Lessees must seek to avoid unfavorable cable placement including avoidance of Federal Aids to Navigation (ATONs) Private Aids to Navigation (PATONs) anchorage areas (including Ambrose Anchorage) Traffic Separation Schemes and Fairways. If these cannot be avoided the Lessees will coordinate with USCG and make best efforts to route the cable as directly across these routing schemes as reasonably practicable. Cables that need to cross the proposed New York to New Jersey Connector Fairway tug-and-tow lane should cross as perpendicularly to the lane as feasible. Previously Applied as a COP T&C: Category: D JACP Comment: This measure is duplicative of PATON and other processes in place with USCG and falls within USCG jurisdiction and should be removed.	BOEM has cable-placement authority, not USCG. This is a measure that has not been applied in previous COP approvals and was analyzed in Sub-alternative C2. BOEM has revised the AMMM measure to remove that last two sentences to clarify this.

Table P.5.23-8. Responses to Substantive Comments on Mitigation and Monitoring—Engineering and Technical Review Branch

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BOEM-2024-0001-0313-0026	2.3 Non-routine Activities and Events The section on severe weather and natural events states "One of these standards calls for the structure to be able to withstand a 50-year return interval event. An additional standard includes withstanding 3-second gusts of a 500-year return interval event which would correspond to Category 5 hurricane windspeeds." Comment Despite assurances that these WTGs are designed to withstand severe storms a catastrophic contingency plan should be provided to address destroyed or substantially damaged TWGs and OSSs. The power of nature trumps design assurances and should be included in the PEIS. Additionally although it is understood that not all catastrophic impacts can be anticipated and evaluated things such as lighting strikes can and should be included in the final PEIS especially as there have been increased reports on WTGs catching fire preventatives planning measures mitigation measures and potential impacts to water quality should be provided in the PEIS.	Thank you for your comment. Fires have been added to Section 2.3, *Non-routine Activities and Events*. Accidental releases from equipment failure and other non-routine events such as toppling during a storm or an earthquake are described in Section 3.4.2, *Water Quality*. An Emergency Response Plan is prepared by lessees as part of the COP to outline procedures for emergency incident scenarios, which include fires. Additionally, BOEM and BSEE are working to update language that requires a lessee's standard operating procedures (developed as part of the Emergency Response Plan) that are used in the case of emergencies, accidents, or non-routine conditions to consider mass marine debris events.
BOEM-2024-0001-0352-0008-c	MUL-2: Anchoring plan. We generally support this AMMM measure; however as written it provides lessees too much flexibility (e.g. "to the maximum extent practicable" and "wherever feasible"). It should be revised to be more prescriptive while still allowing for deviations to ensure safety.	MUL-2 has been previously applied in previous COP approvals and will remain an AMMM measure in the PEIS. AMMM measures are not based on flexibility but the extent to which they are safe and economically and technically feasible. Project details would be revisited during the project-specific COP NEPA review. At this programmatic review stage, it is not practical to identify exact locations where boulders will be located.
BOEM-2024-0001-0406-0021-b	MUL-28 an inadvertent return (IR) plan that will be developed as part of the state permitting process.	BOEM has reviewed all AMMM measures in Appendix G and identified measures that are RPs for the offshore wind industry. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action. MUL-28 is now an RP and the language has been updated to include coordination with the applicable agencies. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs.
BOEM-2024-0001-0439-0075	Measure ID: MUL-28 Measure Name: Inadvertent Returns (IR) Plan and drilling fluids Description: Lessees should develop an Inadvertent Returns (IR) Plan to address prevention control and clean-up of	Refer to response to comment BOEM-2024-0001-0406-0021-b. HDD occurs almost exclusively outside of the OCS, where BOEM does not have enforcement authority.

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	potential IR which is the unintended release of drilling fluids to the surface during drilling operations. To the extent practicable use biodegradable drilling solution and recirculate and recycle drilling fluids used during HDD construction to minimize required water use. Avoid discharging drilling fluids onto the seabed. Previously Applied as a COP T&C: Category: VACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs.	
BOEM-2024-0001-0422-0013	OU-1 Mitigation for oceanographic high frequency radars Comment #11 on OU-1 Attentive Energy recommends BOEM remove reference to "curtailment/curtailment agreement". Curtailment could have serious financial ramifications and make a project not economically viable and as such requiring its inclusion is highly problematic. The inclusion of an uncertain obligation to curtail could negatively impact a project's ability to receive financing and could make an EIS alternative including this AMMM not feasible. The windfarm curtailment agreement is unclear and potentially problematic. Please clarify why a curtailment agreement should be part of a data sharing agreement. It is also possible some of the wind turbine performance data requested in this measure would be proprietary and therefore sharing this information publicly might compromise project financing and other considerations. Attentive Energy recommends adding language to make clear the sharing of proprietary information would not be required.	The interpretation of the AMMM measure is incorrect. The AMMM measure offers options to mitigate operational impacts, which include curtailment, but that itself is not a requirement. Details of a data-sharing or curtailment agreement would be finalized in discussions with affected stakeholders at the COP-specific NEPA stage. In addition, see response to comment BOEM-2024-0001-0371-0052 regarding the change to OU-1.
BOEM-2024-0001-0439-0084	Measure ID: OU-1 Measure Name: Mitigation for oceanographic high frequency radars Description: BOEM would require that the Lessee coordinate with the radar operators and the Surface Currents Program of NOAA Integrated Ocean Observing System (IOOS) Office to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case the Lessee must notify BOEM and engage radar operators and NOAA IOOS on mitigation efforts. The following options to mitigate operational impacts on oceanographic high-frequency radars have been identified: Data sharing from turbine operators to include the following: Sharing real-time telemetry of surface currents and other oceanographic data measured at locations in the project	This AMMM measure only requires lessees to coordinate with radar operators for impact assessment. Analysis of project-specific design would be required to determine whether mitigation is required; this would be done at the subsequent project-specific COP NEPA review. This is a measure that has been applied in previous COP approvals and will remain an AMMM measure in the PEIS. In addition, see response to comment BOEM-2024-0001-0371-0052 regarding the change to OU-1.

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	with radar operators into the public domain. Sharing time-series of blade rotation rates nacelle bearing angles and other information about the operational state of each of the project's turbines with radar operators to aid interference mitigation. Wind farm curtailment/curtailment agreement between NOAA IOOS Lessee and BOEM Additional modifications identified for oceanographic high-frequency radar systems to mitigate impacts: Signal processing enhancements. Antenna modifications Previously Applied as a COP T&C: Category: T/EACP Comment: This AMMM is being considered without specific analysis of impacts from offshore wind development in the NY Bight lease areas to this radar system. The fundamental purpose of mitigation measures in NEPA is to address a reasonably foreseeable impact of the Proposed Action. A general high-level analysis of impacts to radar systems is presented; however this analysis does not cover specific impacts from offshore wind development in the NY Bight leases. In order for this mitigation measure to be included in the final PEIS an analysis of the impacts to oceanographic high frequency radar systems must be included in the document and specific impacts from offshore wind development in the NY Bight must be demonstrated as reasonably foreseeable. In addition the analysis should demonstrate what mitigations could be part of this agreement and how effective they would be at reducing impacts. This analysis should also consider the benefits of those measures when balanced against how they impact the project and any reductions in energy production or increased costs to ratepayers. If this analysis is not included or if specific impacts cannot be demonstrated then this measure must be removed. In addition the windfarm curtailment agreement is problematic and may be economically infeasible Projects that rely on project finance will not be able to obtain financing with uncertain curtailment conditions. Curtailment is considered in COPs specifically for USCG search and rescue.	
BOEM-2024-0001-0423-0029	Other Uses (radar marine minerals NMFS surveys)[bold: OU-1 and OU-2] concern mitigation for interference with NOAA and NEXRAD radar systems including wind farm curtailment of operations. Ocean Winds recommends removal of references to curtailment and curtailment agreements in these measures. Developers can work	See response to comment BOEM-2024-0001-0371-0052 regarding OU-1 and OU-5. In addition, the commenter's interpretation of OU-1 is incorrect. OU-1 offers options to mitigate operational impacts, which include curtailment, but that itself is not a requirement. Details of a data-sharing or

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	with the Department of Defense National Weather Service and NOAA to correct radar interferences with reprogramming sharing of wind field environmental data adding additional other sensors in lease areas and so on as outlined in BOEM-required mitigation agreements. Curtailment is a blunt instrument especially where other measures can correct problems while allowing the system to operate.[bold: OU-5] would require Lessees to[italicized: "enter into a mitigation agreement with the Surface Currents Program of NOAA's Integrated Ocean Observing System (IOOS) Office to determine if the Lessee's project causes radar interference to the degree that radar performance is no longer within the specific radar systems' operational parameters or fails to meet NOAA IOOS's mission objectives and to establish a mitigation agreement."]This seems like a COP-specific NEPA review item that would be addressed with NOAA during that process. A general requirement to mitigate not knowing what the interference might be and how much the mitigation will cost adds uncertainty to CapEx and future OpEx/revenues.	curtailment agreement would be finalized in discussions with affected stakeholders at the COP-specific NEPA stage. OU-2 is now analyzed as an AMMM measure that has not been previously applied (refer to response to comment BOEM-2024-0001-0371-0004 for more information).
BOEM-2024-0001-0422-0014	OU-2 Mitigation for NEXRAD weather radar systems Comment #12 on OU-2As with OU-1 Attentive Energy recommends BOEM remove reference to "curtailment/curtailment agreement". Curtailment could have serious financial ramifications and make a project not economically viable as such requiring its inclusion is highly problematic. The inclusion of an uncertain obligation to curtail could negatively impact a project's ability to be financed. Attentive Energy recommends removing discussion of curtailment and curtailment agreements in this AMMM given the significant possible ramifications and encourages BOEM to seek other mitigatory measures.	Refer to response to comment BOEM-2024-0001-0423-0029.
BOEM-2024-0001-0439-0085	Measure ID: OU-2 Measure Name: Mitigation for NEXRAD weather radar systems Description: Operational mitigations to NEXRAD weather radar systems include the following: Wind farm curtailment/curtailment agreement Research is being conducted to determine whether impacts on weather radar can be mitigated by using phased array radars to achieve a null in the antenna radiation pattern in the direction of the wind turbine. Previously Applied as a COP T&C: Category: T/E BACP Comment: This AMMM is being	Refer to response to comment BOEM-2024-0001-0423-0029.

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	considered without any specific analysis of impacts from offshore wind development in the NY Bight lease areas to this radar system. A general high-level analysis of impacts to radar systems is presented; however this analysis does not cover specific impacts from offshore wind development in the NY Bight leases. The fundamental purpose of mitigation measures in NEPA is to address a reasonably foreseeable impact of the Proposed Action. In order for this mitigation measure to be included in the final PEIS an analysis of the impacts to the NEXRAD radar system must be included in the document and specific impacts from offshore wind development in the NY Bight must be demonstrated as reasonably foreseeable. In addition the analysis should demonstrate how curtailment would mitigate those impacts and if the benefits of implementation of curtailment is justified when compared to the harm caused to projects as a result of its implementation. If this analysis is not included or if specific impacts cannot be demonstrated then this measure must be removed. In addition the windfarm curtailment agreement is problematic and may be economically infeasible. Projects that rely on project finance will not be able to obtain financing with uncertain curtailment conditions. Curtailment is considered in COPs specifically for USCG search and rescue.	
BOEM-2024-0001-0439-0086	Measure ID: OU-3 Measure Name: Mitigation for ARSR-4 and ASR-8/9 radars Description: Operational mitigations identified for impacts on airport surveillance radar (ASR)-8/9: Passive aircraft tracking using ADS-B or signal/transponder Increased aircraft altitude near radar Sensitivity time control (range-dependent attenuation)Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates)Track initiation inhibiting velocity editing plot amplitude thresholding (limiting the amplitude of certain signals)Modification mitigations for ARSR-4 and for ASR-8/9 systems: Utilizing the dual beams of the radar simultaneously In-fill radars Previously Applied as a COP T&C: Category: T/E DACP Comment: These measures should be developed through consultation with the DoD Clearinghouse and other agencies that would implement these measures and should not be prescribed in an AMMM. Developers can only provide in-fill radars as a mitigation. All others are internal settings or something operators can already do.	BOEM has revised OU-2 and OU-3 to reflect the need for coordination to develop potential mitigations. The mitigations included in this AMMM measure should be considered. Additional mitigation measures outside of lessees providing data to radar operators may be considered at the project stage, as well as those based on project-specific information.

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BOEM-2024-0001-0439-0088	Measure Name: HF radar interference mitigation agreement Description: At least 60 calendar days prior to completion of construction or initiation of commercial operations (whichever is earlier) the Lessee must enter into a mitigation agreement with the Surface Currents Program of NOAA's Integrated Ocean Observing System (IOOS) Office to determine if the Lessee's project causes radar interference to the degree that radar performance is no longer within the specific radar systems' operational parameters or fails to meet NOAA IOOS's mission objectives and to establish a mitigation agreement. Within 15 calendar days of entering into the mitigation agreement the Lessee must provide BOEM with a copy of the executed mitigation agreement. Within 45 calendar days of completing any requirements in the mitigation agreement the Lessee must provide BOEM and BSEE with evidence of compliance with those requirements. Where possible the Lessee will adhere to the recommendations for mitigation to marine radar interference from the National Academy of Science: Wind Turbine Generator Impacts to Marine Vessel Radar (2022). Previously Applied as a COP T&C: Category: ACP Comment: This AMMM is being considered without any specific analysis of impacts from offshore wind development in the NY Bight lease areas to this radar system. The fundamental purpose of mitigation measures in NEPA is to address a reasonably foreseeable impact of the Proposed Action. In order for this mitigation measure to be included in the final PEIS an analysis of the impacts to the HF radar system must be included in the document and specific impacts from offshore wind development in the NY Bight must be demonstrated as reasonably foreseeable. In addition the analysis should demonstrate what mitigations could be part of this agreement and how effective they would be at reducing impacts. This analysis should also consider the benefits of those measures when balanced against how they impact the project and any reductions in energy production or increased costs to ratepayers. If this analysis is not included or if specific impacts cannot be demonstrated then this measure must be removed. This measure has the potential to delay commercial operations. Timeframes for approval must be included.	OU-5 has been required in previous COP approvals and, therefore, is a measure that the offshore wind industry is familiar with for projects on the Atlantic OCS. OU-5 has been merged with OU-1 (refer to response to comment BOEM-2024-0001-0371-0052). Additional mitigation measures outside of lessees providing data to radar operators may be considered at the project stage, as well as those based on project-specific information.

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BOEM-2024-0001-0422-0006	MUL-16 Post-storm event monitoring plan Comment #4 on MUL-16 This measure is unnecessarily burdensome to the offshore wind industry especially as similar measures are not applied to other offshore industries. Inspection schedules are already included in the COP for approval by BOEM and therefore this measure is superfluous. Without specific timeframes for agency review included in this measure this plan could delay the start of construction. To consider such a measure BOEM should: • Elaborate on the perceived special risks the offshore wind industry faces to warrant such a special measure • Confirm it has assessed the potential cost of such a measure and determined it is warranted • Provide the data to support using the one-half design return period as a measure and • Articulate how a developer should plan for the cost of such future unknown measures. Given the multiple uncertainties and questions regarding this measure's implementation Attentive Energy recommends its deletion and suggests reviewing global examples that may inform the concerns raised in this AMMM or whether a single study may provide insight into future specifications for such measures. As currently written this AMMM creates significant uncertainty to a project regarding what is required and the possible cost of such requirements.	BOEM disagrees that the AMMM measure is superfluous. BSEE needs to have awareness of the inspection schedules and methodology. Post-storm monitoring is required by regulations, and this AMMM measure (which has been required in previous COP approvals) outlines what this requirement entails.
BOEM-2024-0001-0423-0023	Multiple Resources [bold: MUL-16] would require a monitoring plan (to monitor "environmental conditions") be developed for post-storm events. However the PEIS does not clarify what classifies a "storm event" or which environmental conditions would need to be monitored. It is in lessees' best interest to monitor offshore wind facilities to ensure that facilities are operating properly and safely. Frequency of operations and maintenance activities is determined by the technology utilized and the site-specific conditions including potential for scour and will be described in the project-specific COP. A minimum inspection requirement of exceedance of one-half the design return period is overly prescriptive and impractical.	This AMMM measure, which has been required as a condition of approval for past COPs, includes an adaptive management element. Because offshore wind is a new industry and in its infancy on the Atlantic OCS, there will be more frequent inspections in the beginning. After the industry becomes more established, BOEM may adjust the inspection frequency when more information is collected. The AMMM measure allows for flexibility to adjust this requirement over the life of the project.

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BOEM-2024-0001-0423-0024	[bold: MUL-18] states that [italicized: "Lessees should coordinate transmission infrastructure among projects. Where practicable transmission infrastructure should use shared intra- and interregional connections have requirements for meshed infrastructure apply parallel routing with existing and proposed linear infrastructure (including export cables and other existing infrastructure such as power and telecommunication cables pipelines) and limit the combined footprint to minimize impacts and maximize potential capacity."]BOEM itself did not assess potential impact reduction by using a shared transmission corridor stating [italicize: "impacts related to shared transmission infrastructure would need to be evaluated once project-specific information is known for each of the six NY Bight projects"] [Footnote 4: Draft PEIS Volume 1 Table 2-3 Alternatives Considered but not analyzed in detail pp 2-20 - 2-21.] but is directing lessees to add this analysis to individual COPs before all of the COPs are published. The States of New York and New Jersey have expressed interest in creating an offshore transmission network (OTN) that would be used by multiple lessees to export electricity to shore. In fact the New Jersey Board of Public Utilities asked the area's Regional Transmission Operator PJM to incorporate New Jersey's offshore wind goals into the regional transmission planning process creating the "State Agreement Approach" (SAA). [Footnote 5: See Generally In the Matter of Offshore Wind Transmission NJBPU Docket No. QO20100630.] BOEM however rejected analyzing that alternative as being speculative and unnecessary given the inclusion of AMMM MUL-18. It is highly likely that any OTN alternative is one that would come out of a state solicitation for a transmission developer to construct such a network and not be in the control of the lessees. MUL-18 however would direct lessees to consider going forward with an OTN themselves and speculate in their COPs on the location and specifications of equipment on an offshore substation and routing of one or more export cables. Ocean Winds suggests that as the OTN would serve potentially all six lease areas it would be only appropriate for it to be considered in the PEIS under cumulative impacts and if a state selects a transmission developer to construct it that transmission developer would need to go through the NEPA process itself for the	Thank you for your comment. Please refer to the response to comment BOEM-2024-0001-0371-0050-d. MUL-18 is an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.

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	transmission facilities they are proposing to build at which point BOEM could tier off the PEIS (or supplement the PEIS with the specific OTN proposed) when conducting the project-specific EIS in evaluating the General Activities Plan application that the transmission developer would submit to BOEM.	
BOEM-2024-0001-0439-0065	Measure ID: MUL-16 Measure Name: Post-storm event monitoring plan Description: The Lessee must provide a plan for post-storm event condition monitoring of the facility infrastructure foundation scour protection and cables to BSEE for review at least 60 days prior to commencing installation activities. The Lessee must receive BSEE's concurrence prior to commencing installation activities. Plans may be submitted separately for the cables (including cable protection) WTG and OSS. The plan must describe how the Lessee will measure and monitor environmental conditions and duration of storm events; specify the environmental condition thresholds (and their associated technical justification) above which post-storm event monitoring or mitigation is necessary; describe potential monitoring mitigation and damage identification methods; and state when the Lessee must notify BSEE of post-storm event related activities. At a minimum post-storm event inspections must be conducted following a storm where conditions exceed one-half the design return period. For example a WTG platform designed for 50-year environmental conditions must be inspected following a storm event with 25-year environmental conditions. BSEE reserves the right to require post-storm mitigations to address conditions that could result in safety risks and/or impacts on the environment. Previously Applied as a COP T&C: CheckCategory1: T/EACP Comment: Inspection schedules are included in the COP for approval by BOEM and therefore this measure is not necessary. The minimum inspection requirement of exceedance of one-half the design return period is overly prescriptive and not technically or economically viable. There are methods and technology that will be used in the monitoring of storm events and their impact on project assets that will obviate the need for this frequency of inspections. Further without specific timeframes for agency review this is another example of a plan that can delay construction start.	Refer to responses to comments BOEM-2024-0001-0423-0023 and BOEM-2024-0001-0422-0006. MUL-16 has been updated and language about review timeframes has been removed.

Comment No.	Comment	Response
BOEM-2024-0001-0451-0005	MUL-16 Post-storm event monitoring: The Lessee must provide a plan for post-storm event condition monitoring of the facility infrastructure foundation scour protection and cables to BSEE for review at least 60 days before commencing installation activities At a minimum post-storm event inspections must be conducted following a storm where conditions exceed one- half the design return period. For example a WTG platform designed for 50-year environmental conditions must be inspected following a storm event with 25-year environmental conditions. BSEE reserves the right to require post-storm mitigations to address conditions that could result in safety risks and/or impacts on the environment. This AMMM does not reflect industry practice. The timeline of this condition is not aligned with cable run inspection thresholds and does not match the return period of the design. The timeline should be limited to the engineered design life. A standard design life is for ULS a 50-year return period and a 500-year return period. Half the design life is then either a 25-year storm or a 250-year storm which is specified in this proposed condition. The requirement should reflect the full design life.	Design life is not used in this AMMM measure. The intent of the AMMM measure is to require inspection during potentially damaging conditions rather than waiting until catastrophic conditions occur (i.e., to ensure conditions do not reach a point of catastrophic failure).
BOEM-2024-0001-0352-0008-d	MUL-16: Post-storm event monitoring plan - We generally support this AMMM measure; however as written it essentially requires just a plan without associated action.	Thank you for your comment. The intent of the AMMM measure is to require inspection during potentially damaging conditions rather than waiting until catastrophic conditions occur (i.e., to ensure conditions do not reach a point of catastrophic failure).

Table P.5.23-9. Responses to Substantive Comments on Mitigation and Monitoring—Environmental Justice (EJ)

Comment No.	Comment	Response
BOEM-2024-0001-0406-0021-c	EJ 1-4 whose environmental justice measures relate solely to onshore impacts and are likely to conflict with or duplicate state permitting and procurement requirements.	Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have been included in previous BOEM COP approvals from AMMM measures that have not been included in previous COP approvals; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and

Comment No.	Comment	Response
		minimize impacts. These RPs are not part of the Proposed Action. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information. BOEM's review and revision of AMMM measures has resulted in EJ-1 from the Draft PEIS being split into a not previously applied AMMM measure (EJ-1a) and an RP (EJ-1b), and EJ-2 becoming an RP. AMMM measure EJ-1a and RP EJ-2 have been revised to further reduce potential duplication with existing state and local requirements and describe how lessees may refer to other requirements to satisfy the AMMM measure. EJ-3 has been updated for clarity in the Final PEIS. EJ-4 is no longer an AMMM measure being considered in the PEIS (refer to response to comment BOEM-2024-0001-0319-0004).
BOEM-2024-0001-0439-0018	V. BOEM should remove certain AMMMs from consideration. Even assuming BOEM reframes the PEIS and acknowledges that the agency is considering AMMM measures that it [italicized: may] require as conditions of approval it should remove from consideration certain inappropriate AMMMs. Attachment A provides the OSW industry's detailed comments on specific AMMMs. As demonstrated by those comments many of the AMMMs proposed by BOEM are inappropriate because to varying degrees they are outside of BOEM"s statutory authority and are duplicative are more suitably proposed as COP guidance will be technically or economically infeasible will create untenable safety issues or undue burden on industry and/or are voluntary. a. BOEM should remove AMMMs that are outside their statutory authority and duplicative. An agency "may not exercise its authority in a manner that is inconsistent with the administrative structure that Congress enacted into law."[Footnote 38: Food and Drug Admin. v. Brown & Williamson Tobacco Corp. 529 U.S. 120 125 120 S.Ct. 1291 146 L.Ed.2d 121 (2000) (quoting ETSI Pipeline Project v. Missouri 484 U.S. 495 517 108 S.Ct. 805 98 L.Ed.2d 898 (1988)).] As such BOEM cannot implement AMMMs that are outside of its authority. While a NEPA analysis can review mitigation measures that are not within an agency's authority the agency cannot impose these measures on the lessee or adopt them in a ROD but can only cross-reference those measures to provide for interagency coordination. In fact "Agencies	Refer to responses to comments BOEM-2024-0001-0406-0021-c and BOEM-2024-0001-0435-0038 regarding EJ-1 through EJ-4. Refer to response to comment BOEM-2024-0001-0406-0017 regarding AQ-1 through AQ-5. MUL-7 is now identified as an RP in the PEIS.

Comment No.	Comment	Response
	should not commit to mitigation however unless they have sufficient legal authorities and expect there will be necessary resources available to perform or ensure the performance of the mitigation."[Footnote 39: Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact 76 FR 3843 (Jan. 2011)] Indeed BOEM itself notes that not all "AMMM measures are within BOEM's statutory and regulatory authority; those that are not may still be adopted and imposed by other governmental agencies."[Footnote 40: DPEIS Appendix G.] As such BOEM should not develop duplicative or additive AMMM[Footnote 41: As discussed below the AMMM implies it is within BOEM's authority to issue. Instead BOEM should simply analyze the environmental effects of air permits that would be required by EPA.] or impose any requirements for measures that fall outside of their statutory authority. Instead BOEM should defer to cooperating agencies with regulatory authority to impose certain mitigation measures.[Footnote 42: See Wyoming v. U.S. Dep't of the Interior 493 F. Supp. 3d 1046 (D. Wyo. 2020) (BLM rule referencing EPA regulations "usurps the authority to regulate air emissions Congress expressly delegated to the EPA").] For example AQ-1 through AQ-5 would impose air quality requirements; however emissions in the NY Bight lease area are regulated by the Environmental Protection Agency ("EPA") under its Clean Air Act regulations at 40 C.F.R. Part 55. AQ-1through AQ-5 are duplicative of EPA's air permit process and create the potential for conflicting requirements and confusion. Through the OCS Air Permit process applicants will perform a Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER) analysis for each emission source and New Source Review (NSR) air pollutant that is emitted in excess of thresholds set forth in the Prevention of Significant Deterioration (PSD) regulations and/or the regulations of the Corresponding Onshore Area. For example with respect to AMMM AQ-4 as part of the BACT/LAER analysis applicants will assess the feasibility of add-on pollution controls (e.g. Selective Catalytic Reduction Selective non-Catalytic reduction NOx Adsorber/Scrubber	

Comment No.	Comment	Response
	Lean NOx Catalysts SOx Scrubber Diesel Particulate Filter Diesel Oxidation Catalyst etc.) on vessels and engines on the WTGs and ESPs. EPA is responsible for reviewing and concurring with an applicant's justification for why these add-on pollution controls are technically and/or economically infeasible through the BACT/LAER process not BOEM and BSEE. BOEM should not use its AMMMs to reinforce existing standards or legal requirements over which it has no authority itself. Similarly MMST-13 attempts to characterize existing vessel speed rules but may ultimately create conflict if those regulations are modified. EJ-1 would require lessees to develop an Environmental Justice Communications Plan but an Environmental Justice Plan is already required by both the states of New York and New Jersey. AMMMs that are duplicative of (and potentially in conflict with) existing state or Federal requirements should be removed from BOEM's proposed AMMMs. Finally with AMMM MUL-7 BOEM attempts to meet International Maritime Organization ("IMO") standards. These standards are outside of BOEM's jurisdiction and authority and BOEM may not use AMMMs developed through NEPA to enforce compliance with those standards (see Attachment A for additional examples).	
BOEM-2024-0001-0439-0047	Measure ID: EJ-1 Measure Name: Environmental Justice Communications Plan Description: The Lessee must submit a draft Environmental Justice Communications Plan (EJ Communications Plan) for communicating with Environmental Justice (EJ) communities or populations (defined for all mitigations as "communities with environmental justice concerns" or underserved communities as related to the intent of Executive Orders 12898 and 14096 referred to herein as "EJ populations") as a part of its initial COP submission or in subsequent updated versions. The EJ Communications Plan must document the process of how the Lessee plans to communicate during activities described in the COP including construction operations and decommissioning. Because potential impacts on EJ populations are expected to be much lower during operations than during construction or decommissioning the EJ Communications Plan should reflect different levels of communications needed as appropriate during these different stages. The Lessee may utilize	Refer to responses to comments BOEM-2024-0001-0406-0021-c and BOEM-2024-0001-0435-0038 regarding EJ-1 through EJ-4.

Comment No.	Comment	Response
	efforts or language developed for any state requirements to satisfy this EJ Communication Plan partially or wholly. The EJ Communications Plan must specifically target low-income and minority populations and communities identified by applicable state-level EJ and related screening tools and advance meaningful engagement based on each affected community's unique communication and information needs. The plan must be finalized prior to COP decision. In the EJ Communications Plan the Lessee must: Describe which EJ populations may be potentially affected by COP activities with sufficient detail about which activities could impact which areas or populations and at what times. In identifying EJ populations Lessees should use both federal and state-level screening tools with an intent to be as inclusive as possible and meet the most recent guidance and best practices. At minimum the following screening tools should be used as applicable to the project location: Environmental Protection Agency's EJ Screen [https://www.epa.gov/ejscreen] New York Department of Environmental Conservation Potential Environmental Justice Areas [https://dec.ny.gov/get-involved/environmental-justice/gis-tools] New York State Disadvantaged Communities Mapping Tool [https://climate.ny.gov/resources/disadvantaged-communities-criteria/] and New Jersey Department of Environmental Protection EJMAP [https://dep.nj.gov/ej/communities-location/] tool. Lessees should review additional data sources and tools for potential incorporation and must document the sources and methods for identifying EJ populations included in the EJ Communications Plan. Describe how each potentially affected EJ population desires to be communicated with during activities described in the COP (e.g. communication methods language needs).Describe how coordination with other Lessees in the region will occur in advance of communication with EJ populations especially in cases where onshore activities described in the COP may be in proximity to other projects. The intent of coordination is to reduce engagement redundancy and burden on EJ populations. Describe how Lessees will communicate when and where activities described in the COP will take place who they may affect and how they may affect EJ populations. Describe	

Comment No.	Comment	Response
	how Lessees will respond to any concerns or questions from EJ populations during activities described in the COP and the process Lessees will undertake to communicate with EJ populations to ensure these concerns or questions are addressed. Include how the Lessee will handle any questions or concerns that are not related to that Lessee's activities or applicable to regional offshore wind activities. Describe when how and to whom employment opportunities are advertised and how the Lessee plans to maximize access to those opportunities for low-income and minority populations including but not limited to the communication and advertising for training programs and hiring processes. Describe how the Lessee will communicate investment or supply chain opportunities to meet any Lessee commitments to diversity or equal access including but not limited to those included in NY Bight lease stipulation 7.1. Describe any related requirements or ongoing efforts in coordination with the states of New York and New Jersey. Include a summary of feedback received from EJ populations on the above bullets (see EJ-3).Category: DACP Comment: An EJ Plan is required by both NYS and NJ. An additional EJ Plan would be duplicative of current State requirements and will lead to confusion with multiple determinations and approvals that may be conflicting.	
BOEM-2024-0001-0467-0002	UPROSE and NYC-EJA also strongly encourage that the proposed mitigation measures under the adoption of Alternative C that require each lessee to develop an EJ Communication Plan and EJ Mitigation Resources Plan be amended to require the creation of these plans in coordination with environmental justice communities. Environmental and climate justice community residents advocates and organizations impacted by direct and indirect offshore wind activities in the New York Bight are well-positioned to inform lessees about the best ways to communicate information within their communities and what mitigation strategies will be most effective and equitable. We urge BOEM and lessees to continue deep engagement with environmental justice communities and organizations on a long-term continuing basis.	BOEM has revised all applicable AMMM measures, including EJ-1 (EJ-1 from the Draft PEIS was split into a not previously applied AMMM measure [EJ-1a] and an RP [EJ-1b]) and EJ-3, to more strongly reflect the requirement for lessees to create plans in coordination with environmental justice communities and organizations that serve them and reflect the intent of the AMMM measures to set up long-term, continual engagement throughout the life of offshore wind projects. Note that EJ-2 has been revised to be an RP as an “Environmental Justice Impact Mitigation Resources Plan” and includes recommendation that the plan be developed in coordination with environmental justice communities. Refer to responses to comments BOEM-2024-0001-0406-0021-c and BOEM-2024-0001-0435-0038 for additional information on AMMM measure revisions.

Comment No.	Comment	Response
BOEM-2024-0001-0439-0048	Measure ID: EJ-2 Measure Name: Environmental Justice Mitigation Resources Plan Description: Lessees must submit along with the draft EJ Communications Plan (EJ-1) as part of their initial COP submission or in subsequent updated versions a draft Environmental Justice Community Mitigation Resources Plan (EJ Mitigation Resources Plan) for providing households in EJ populations that are impacted by activities described in the COP (affected households) with any supplies or mitigation resources needed (e.g. air filters noise canceling headphones blackout curtains) to reduce adverse impacts. The EJ Mitigation Resources Plan must provide sufficient detail on how eligibility for mitigation resources will be determined including duration for which resources will be provided based on anticipated activities and localized impacts including examples. The plan must also outline roles and responsibilities of households and Lessees and there should be clear guidelines around principles of equity transparency and fairness. The plan must be finalized prior to COP decision. Category: D JACP Comment: An EJ Plan is required by both NYS and NJ. An additional EJ Plan would be duplicative of current State requirements and will lead to confusion with multiple determinations and approvals that may be conflicting. Mitigation measures listed appear to be primarily related to State and/or onshore impacts outside the jurisdiction of BOEM.BOEM should demonstrate why mitigation measures for other resource areas are insufficient for EJ communities.	Refer to responses to comments BOEM-2024-0001-0406-0021-c and BOEM-2024-0001-0435-0038. Note that EJ-2 has been revised to be an RP as an “Environmental Justice Impact Mitigation Plan” (EJ-2) and language has been added to recommend that state and local requirements are described in the plan to ensure there is no duplication of mitigation efforts.
BOEM-2024-0001-0406-0019	EJ-4 which would require lessees to contribute an annual amount (which could be as large as 1% of total revenue a significant sum) to "a third-party managed compensatory mitigation fund to address disproportionate and adverse impacts on EJ populations directly tied to OCS offshore wind activities as related to the impact analysis discussed in the COP-specific NEPA review that has not been addressed through another mitigation measure." While COSW embraces the need to ensure its project minimizes harm and provides benefits to environmental justice communities it is unclear why this fund is needed. BOEM's own analysis fails to demonstrate that any adverse effects of NYB offshore wind development that may not be addressed through other measures (e.g. air emissions at port facilities	Refer to response to comment BOEM-2024-0001-0319-0004.

Comment No.	Comment	Response
	commercial fishing concerns) are likely to fall more heavily on EJ communities. See Draft PEIS 3.6.4 (pp. 3.6.4-1 to -35). Given the extraordinary time and expense required to establish fund and operate third-party compensatory mitigation funds they should be reserved for only the largest and most significant unavoidable impacts.	
BOEM-2024-0001-0436-0015	e. Mitigation Commensurate with Effects Some of the new AMMMs presented in the Draft PEIS presume undefined impacts of a specific type will occur and warrant compensatory mitigation according to a pre-set formula. For example EJ-4 (EJ compensatory mitigation) requires lessees to financially contribute annually an amount (not to exceed 1% of revenue calculated per MWh) for the duration of electricity production to a third-party managed compensatory mitigation fund to address disproportionate and adverse impacts on EJ populations directly tied to OCS offshore wind activities. Consistent with the definition of mitigation 40 CFR 1508.1(s) developers should not be forced to pay for measures that do not demonstrate a "nexus to those effects" of their actions. Any AMMM adopted by BOEM should demonstrate a clear reduction or offset in impacts. AMMMs should provide environmental benefits that are proportional to the effects of the actions being mitigated are not duplicative of mitigation already provided by associated conservation measures and durable in their contribution to science or the duration of the effects of the actions being mitigated.	Refer to response to comment BOEM-2024-0001-0319-0004.
BOEM-2024-0001-0439-0049	Measure ID: EJ-4 Measure Name: EJ compensatory mitigation Description: Lessees will financially contribute annually an amount (not to exceed 1% of revenue calculated per MWh) for the duration of electricity production to a third-party managed compensatory mitigation fund to address disproportionate and adverse impacts on EJ populations directly tied to OCS offshore wind activities as related to the impact analysis discussed in the COP-specific NEPA review that has not been addressed through another mitigation measure. Fund contributions will be based on analysis of residual disproportionate and adverse impacts in the COP-specific NEPA review. Lessees will	Refer to response to comment BOEM-2024-0001-0319-0004.

Comment No.	Comment	Response
	contribute to the fund upon selection of this measure as a condition of approval of the COP.A Board of Trustees with representatives from impacted communities community-based organizations state representatives Tribal Nations and offshore wind Lessees will be set up to make decisions and liaise with the third-party fund managers. A multi-party group with representatives from each aforementioned category will be convened in coordination with third-party fund managers to develop a Charter that specifies roles responsibilities and the selection process for the Board of Trustees. The amount of the contribution(s) will be calculated based on residual impacts and flexible under the 1% threshold and may be adjusted as needed based on the level of impacts occurring which will vary over the life of the project. Specific criteria of fund management and fairness (e.g. fiduciary controls minimization of administrative expenses representation of underserved communities on the board of trustees) will be set to ensure proper management of the fund and selection criteria for recipients of funds. Managed funds would be distributed by the third-party manager as grant(s) to households businesses community-based organizations or other appropriate recipient that demonstrate they (1) meet the definition of being part of an EJ population or community with environmental justice concerns (as defined under Executive Orders 12898 or 14096) or potential EJ areas identified by New York Department of Environmental Conservation or New Jersey's Environmental Justice Law (New Jersey Statutes Annotated 13:1D-157) definition of overburdened communities and (2) have been disproportionately and adversely impacted by OCS offshore wind activities. Any monetary distributions from the fund shall accomplish at least one of the following objectives: (1) improve household or community-level responses or ability to adjust to disproportionate and adverse impacts including lost wages or job loss; (2) protect or improve community-wide access to coastal recreation and greenspace areas or enjoyment of coastal viewsheds to offset any changes directly caused by OCS offshore wind activities; or (3) enhance community welfare to offset disproportionate and adverse impacts of OCS activities on community welfare. Eligible impacts must be a direct result of OCS offshore wind activities and not otherwise	

Comment No.	Comment	Response
	mitigated. The mitigation measure applies to BOEM-authorized and -permitted activities and associated support activities which could occur on the OCS or onshore. Category: D JACP Comment: More explanation is needed on how the 1% of revenue amount was selected. Using a price of $130 per MWh and assuming 45% capacity factor this would come to approximately $4.1 million in annual revenue for an 800 MW project or a total of over $100 million over a 25-year life of a project which is not economically viable unless the States allow for an adjustment to PPAs to account for this loss of revenue. For those projects that do not yet have PPAs the mitigation costs would be factored into pricing and would thus be passed along to ratepayers including those in EJ communities. Furthermore BOEM indicated that this measure was needed to account for any unanticipated /unforeseen impacts which is inconsistent with NEPA. NEPA analysis and mitigation is for reasonably foreseeable impacts. The analysis presented lacks sufficient detail to assess a need for a mitigation measure of this type. In order for such a measure to be considered for adoption BOEM would need to demonstrate in the final PEIS what specific impacts to EJ communities would occur for offshore wind and how this level of funds would be needed to address those impacts. The final PEIS would need to answer what aspects of the project activities analyzed within the COP triggers the need for this significant level of mitigation? EJ impacts are primarily related to onshore impacts outside the jurisdiction of BOEM and as noted above are addressed through State and local requirements. Offshore cultural and fisheries impacts mentioned in this measure are mitigated through other AMMMs and environmental laws including compensatory mitigation. BOEM would need to demonstrate why mitigation measures for other resource areas are insufficient to mitigate for impacts to EJ communities. Community Benefits Agreements specific to the impacts on affected community and stakeholders are a better alternative for supporting EJ communities.	
BOEM-2024-0001-0422-0019	EJ-4 EJ compensatory mitigation Comment #17 on EJ-4: While Attentive Energy supports the intent of this AMMM the measure as written is difficult to justify and implement. The proposed funding amount while seemingly a small percentage is significant over the life	Refer to response to comment BOEM-2024-0001-0319-0004.

Comment No.	Comment	Response
	of the project and would degrade the project's economic viability especially for projects that have already secured offtake agreements. Both New York and New Jersey already require significant efforts toward environmental justice communities as part of their Offshore Renewable Energy Certificate ("OREC") processes and therefore this proposed AMMM is duplicative of other efforts and requirements. Attentive Energy encourages BOEM to coordinate closely with the states so as to ensure efforts to address environmental justice are efficient and not duplicative. Attentive Energy has significant questions regarding this AMMM: • The analysis used by BOEM to determine that "1% of revenue calculate per MWh" is appropriate and would not undermine any individual project's economic viability is not articulated and Attentive Energy requests that this analysis be added to the AMMM. • Can BOEM clearly articulate the statutory and regulatory grounds under which it justifies requiring such a contribution? • Who will conduct the "analysis of residual disproportionate and adverse impacts in the COP-specific NEPA review" and what criteria will guide this analysis? • What will be the process to establish the board of trustees? Will membership be capped at a certain number? Will developers be involved in selecting members?	
BOEM-2024-0001-0423-0016	[bold: EJ-4] directs lessees to financially contribute annually an amount up to 1% of revenue (not profit) for the life of the project to mitigate any disproportionate adverse impacts to environmental justice communities. Ocean Winds notes that many of the burdens EJ communities have had to bear come from siting fossil fuel electric generation facilities with their associated impacts to health in those communities. Given the likely positive impacts in air quality and the potential creation of jobs for communities from offshore wind projects as well as the lack of measurable indicators of adverse impact directly tied to the operation of such projects this open-ended requirement is an overreach and is significantly out of proportion to any impacts. Construction of the onshore project elements may have	Refer to response to comment BOEM-2024-0001-0319-0004.

Comment No.	Comment	Response
	temporary impacts to the surrounding communities (which may or may not be environmental justice communities) that should indeed be mitigated but those impacts would be expected to last no more than weeks for any given community while the benefits of offshore wind will accrue to environmental justice communities for decades. Offshore wind is an essential element in the transition away from the use of the fossil fuel-fired infrastructure that has burdened environmental justice communities for so many decades. Given this Ocean Winds rejects the notion that the offshore wind industry will inherently have a negative impact on environmental justice communities and strongly opposes inclusion of this condition in the PEIS. In fact higher electricity rates due to unnecessary measures like this negatively impact ratepayers including those in EJ communities. Lastly as noted above any such local impact can be addressed through state and local permitting. The application of a compensation fund is a last resort where no other AMMM can adequately reduce impacts. As such it is not an appropriate use of a PEIS.	

Table P.5.23-10. Responses to Substantive Comments on Mitigation and Monitoring—Recreation and Tourism (REC)

Comment No.	Comment	Response
BOEM-2024-0001-0406-0021-d	REC-1 which would regulate the timing of onshore construction may not apply to all landfall locations and where it does apply would be a condition of state permitting.	REC-1 is now identified as RP in the PEIS. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on BOEM's review and revisions of AMMM measures and identification of RPs.
BOEM-2024-0001-0439-0091	Measure ID: REC-1 Measure Name: Nearshore construction timing restriction Description: Lessees should prioritize scheduling of nearshore construction activities for outside the summer tourist season which is generally between Memorial Day and Labor Day. Previously Applied as a COP T&C: Category: V D JACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. Nearshore/onshore activities are subject to regulation/oversight by state and local authorities who are in the best position to provide guidance on what is best for the	REC-1 is now identified as RP in the PEIS. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on BOEM's review and revisions of AMMM measures and identification of RPs.

Comment No.	Comment	Response
	relevant communities. Scheduling/activities should be coordinated with these authorities to determine conflicts with summer tourist season. In addition the terms nearshore should be defined as well as the specific construction activities that should occur outside of the summer tourist season. Many construction activities do not produce disruptive noise or interfere with tourist activities.	

Table P.5.23-11. Responses to Substantive Comments on Mitigation and Monitoring—Multiple Resource Areas (MUL)

Comment No.	Comment	Response
BOEM-2024-0001-0406-0020	iv. Measures That Lie Outside of BOEM's Jurisdiction Certain of the AMMM measures proposed in the Draft PEIS particularly those relating to onshore impacts are outside of BOEM's authority to implement. "Agencies should not commit to mitigation however unless they have sufficient legal authorities and expect there will be necessary resources available to perform or ensure the performance of the mitigation." CEQ Mitigation and Monitoring Guidance at 5 (Jan. 2011). Appendix G appears to propose adoption of numerous measures that can only be imposed and enforced by other agencies through federal state- and local-level permitting in contravention of CEQ guidance. Examples include: AQ-6 and AQ-7 under which BOEM would inappropriately regulate onshore air emissions. Authority to regulate air emissions rests with the EPA and with the states in the onshore environment for non-major sources. The fact that onshore components of an offshore wind project may generate minor amounts of emissions may be relevant to BOEM's COP NEPA analysis but does not give it authority to impose emissions limitations or control requirements on a project. While discussed above in Section IV(b)(i) Measures that are technically and commercially infeasible AQ 1-5 also appear to be under the jurisdiction of the EPA under its Clean Air Act OCS permit program. MUL-18 under which lessees "should coordinate transmission infrastructure among projects." Although it is listed as "voluntary" its adoption would overstep BOEM's jurisdiction by interfering with a process that is largely driven by state procurement decisions and other factors that are largely beyond a project developer's control including the timing of	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. AQ-1 through AQ-7 and MUL-18 are all now listed as RPs. Additional analyses will be conducted at the subsequent project-specific stage for each lease area. Although BOEM's authority under the OCSLA only extends to the activities on the OCS, alternatives related to addressing nearshore and onshore elements as well as offshore elements of the Proposed Action would be analyzed at the project-specific COP NEPA stage. BOEM's regulations (30 CFR 585.620) require that the COP describes all planned facilities that the lessee would construct and use for the project, including onshore and support facilities and all anticipated project easements. As a result, those federal, state, and local agencies with jurisdiction over nearshore and onshore impacts are able to adopt, at their discretion, those portions of BOEM's project-specific COP NEPA analysis that support their own permitting decisions.

Comment No.	Comment	Response
	siting permitting and construction of the regional collector line. While we recognize that utilizing a shared transmission has the potential to minimize conflicts with various other ocean uses and increase overall efficiencies its adoption must be driven by state and commercial considerations and not minimization and mitigation requirements imposed in a NEPA review. [Footnote 7: This obligation is inappropriate as an AMMM measures for the additional reason that the siting of cables must be made pre-COP submittal so that developers can collect the geophysical and geotechnical data required in a COP per the NOI Checklist. Cable routing therefore cannot also be a condition of COP approval.]	
BOEM-2024-0001-0352-0007	We are concerned that several of the AMMM measures in Appendix G provide too much flexibility for lessees making their benefits uncertain and consultation more challenging. For example measure BEN-1 (boulder avoidance identification and relocation) states: "The plan must detail to the extent technically and/or economically practical or feasible for the project how the Lessee will relocate boulders as close as practicable to areas immediately adjacent to existing similar habitat." This seems to invite developers to argue that relocation of boulders to specific and more ecologically appropriate sites is overly costly or impractical. We are not directly involved in these negotiations; however our observation of the South Fork and Revolution Wind projects suggests there may have been pushback on adopting conservation measures recommended by fisheries organizations due to concerns about costs. Offshore wind construction vessel availability is at a premium resulting in pressure to complete work as quickly as possible. Similar language about technical and economic flexibility is included in COMFIS-2 (scour and cable protection) COMFIS-4 (in reference to cable burial depths) MUL-2 (anchoring plan) MUL-3 (berm survey and report) MUL-12 (ecological design elements) and MUL-18 (shared transmission corridor). The language in MUL-4 related to cable protection materials is much more definitive.	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have been included in previous BOEM COP approvals from AMMM measures that have not been included in previous COP approvals; BOEM believes these are all feasible. In addition, several AMMM measures that are RPs are now identified as such in the PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. AMMM measures are not based on flexibility but the extent to which they are safe and economically and technically feasible. Finally, project-specific NEPA analysis for individual COPs could apply revised, additional, or different AMMM measures as needed.
BOEM-2024-0001-0446-0005	[Bold Underline: Monitoring and Adaptive Management Requirements for AMMM Measures Should be Designed to Achieve Similar Objectives Regardless of Taxa and Across the Adjacent Lease Areas.]Ideally the PEIS will encourage shared and coordinated	Thank you for your comment. BOEM strives to take an adaptive approach to assessing impacts when the PDE is known and requiring mitigation measures. BOEM has revised MUL-26 to

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	monitoring efforts across adjacent projects to improve not only cost-effectiveness but also to better support our understanding of cumulative impacts and species' use of the NY Bight in relation to the multiple projects sited within it. The stated purpose of the monitoring required in Appendix G is "to evaluate the effectiveness of AMMM measures or to identify if resources are responding as predicted to impacts from each NY Bight project." See Vol. II Appendix G at G-2. The information generated by monitoring may be used to "(1) alter how an AMMM measure identified in the ROD is being implemented (2) revise or develop new mitigation or monitoring measures for which compliance would be required under the COPs for the six NY Bight lease areas in accordance with 30 CFR 285.633(b)(2) (3) develop measures for future projects or (4) contribute to regional efforts for better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g. potential cumulative impact assessment tool)." Id. It is also important to structure the monitoring for the AMMM measures so that we can learn from earlier project designs and mitigation and make adjustments; either adding AMMM measures moving AMMM measures from voluntary to required and perhaps even moving AMMM measures from required to voluntary (if based on monitoring of early projects we find we have over-estimated risk and impacts). These are the right objectives for monitoring but in order for monitoring to be able to secure these outcomes standard monitoring protocols methods and requirements for adaptation should apply similarly across different taxa and across the adjacent lease areas.	encourage coordination for regional monitoring and surveys across lease areas in the NY Bight.
BOEM-2024-0001-0181-0002	The use of ecological concrete as a nature-based solution would support AMMM measure MUL-12 which "proposes the incorporation of ecological design elements where practicable" including "nature-inclusive design products such as environmental concrete oyster shells or other artificial reefs for cable and scour protection."	Thank you for your comment. MUL-12 is now identified as an RP and is more broad by design, as it does not exclude environmental concrete or oyster shells; this particular design element could be proposed at the project-specific stage. Project-specific NEPA analysis for individual COPs could apply revised, additional, or different AMMM measures as needed.
BOEM-2024-0001-0439-0062	Measure ID: MUL-12 Measure Name: Ecological design elements Description: Lessees are encouraged to incorporate ecological design elements into the project design where practicable. For example nature-inclusive design products are an alternative to traditional	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these

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	concrete that enhance or encourage the growth of flora or fauna when placed in a marine environment and could result in reduced GHG emissions compared to traditional concrete. Another example is using nature-based scour protection such as oyster beds or artificial reefs. Previously Applied as a COP T&C: Category: V GACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. As Alternative C assumes adoption of all AMMMs as terms and conditions of plan approval for the purposes of the PEIS analysis these AMMMs are not in fact voluntary. Adoption of voluntary AMMMs through terms and conditions undermines the very voluntary nature of those measures. In addition this measure constitutes new COP guidance. If BOEM wishes to establish new COP guidance it should go through the formal guidance development process.	are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. MUL-12 is identified as an RP in the PEIS.
BOEM-2024-0001-0352-0008-e	MUL-12: Ecological design elements We generally support this AMMM measure; however we are concerned that use of the phrase “where practicable” provides too much flexibility.	MUL-12 is an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0439-0063	Measure ID: MUL-14 Measure Name: UXO avoidance Description: Lessees should develop and implement standard protocols for addressing unexploded ordnance (UXOs) including implementation of best available technology to avoid or minimize exposure of protected species and sensitive habitats. Where in situ disposal is demonstrated to be necessary for the project the Lessee should consult with state and federal agencies regarding seasonal restriction windows or other precautions. The Lessee must avoid to the maximum extent practicable interactions with UXO/Munitions and Explosives of Concern (MEC). If avoidance is not possible submitted plans should follow all guidance (see Munitions and Explosives of Concern Survey Methodology and In-Field Testing for Wind Energy Areas on the Atlantic Outer Continental Shelf (pnnl.gov) at: https://tethys.pnnl.gov/sites/default/files/publications/Carton-et-al-2017-BOEM.pdf; Supporting National Environmental Policy Act Documentation for Offshore Wind Energy Development Related to Munitions and Explosives of Concern and Unexploded Ordinances (MEC-UXO White Paper [boem.gov]) at:	MUL-14 has been updated and split into MUL-14a (previously applied AMMM measure) and MUL-14b (RP). MUL-14b encourages lessees to consult the U.S. Committee on the Marine Transportation System guidance, when finalized, if avoidance of munitions and explosives of concern is not feasible.

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	https://www.boem.gov/sites/default/files/documents/renewable-energy/state- activities/MEC-UXO%20White%20Paper.pdf; and when finalized the US Committee on the Marine Transportation System general guidance addressing MEC at: https://www.cmts.gov/assets/uploads/documents/DOT-OST-2023-0117-0001_attachment_1.pdf; or any other applicable regulation regarding interaction with UXO/MEC. Previously Applied as a COP T&C: Category: D GACP Comment: Lessees should be directed to guidance being provided by the US Committee on the Marine Transportation System (CMTS). ACP submitted comments on this guidance[Footnote 10: https://www.regula?ons.gov/comment/DOT-OST-2023-0117-0007] and BOEM should not be applying measures outside of this guidance process. The CMTS needs to finalize their guidance document. We also note there is no ongoing guidance on how to deal with UXOs in state waters.	
BOEM-2024-0001-0439-0064	Measure ID: MUL-15 Measure Name: Marine debris monitoring around WTG Description: Lessees must monitor and adaptively mitigate impacts associated with commercial charter and recreational gear lost from expected increases in fishing around WTG foundations by surveying at least 10 of the WTGs located closest to shore in the lease area annually. Surveys by remotely operated vehicles divers or other means will inform frequency and locations of marine debris. The results of the surveys will be reported to BOEM (renewable_reporting@boem.gov) and BSEE (marinedebris@bsee.gov) in an annual report submitted by April 30 for the preceding calendar year in which the survey is performed. Photographic and videographic materials must be provided on a drive. Reports must include daily survey reports that include the survey date contact information of the operator location and pile identification number photographic and/or video documentation of the survey and debris encountered any animals sighted and the disposition of any located debris (i.e. removed or left in place). Required data and reports may be archived analyzed published and disseminated by BOEM. Previously Applied as a COP T&C: Check Category: ACP Comment: These should not be separate "annual" surveys and should be combined with the schedules for other surveys of foundations. This would minimize impacts to the marine	Please refer to response to comment BOEM-2024-0001-0371-0050-c. Marine debris monitoring surveys can be conducted as a component of a broader survey campaign.

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	environment and safety risks associated with more vessels on the water.	
BOEM-2024-0001-0352-0008-f	MUL-15: Marine debris monitoring around wind turbines We support this AMMM measure which would require lessees to monitor and adaptively mitigate impacts associated with fishing gear lost around turbine foundations. It is important however that this lost gear not be used as justification for later implementation of fisheries exclusion zones outside of the Council process.	Thank you for your comment. MUL-15 has been deleted and incorporated into MUL-1.
BOEM-2024-0001-0439-0067	Measure ID: MUL-18 Measure Name: Shared transmission corridor Description: Lessees should coordinate transmission infrastructure among projects. Where practicable transmission infrastructure should use shared intra- and interregional connections have requirements for meshed infrastructure apply parallel routing with existing and proposed linear infrastructure (including export cables and other existing infrastructure such as power and telecommunication cables pipelines) and limit the combined footprint to minimize impacts and maximize potential capacity. Where possible incorporate cable siting principles and routing measures for export cables and associated substations developed from the Atlantic Offshore Wind Transmission Study and the BOEM/DOE transmission planning effort the NYSERDA's Offshore Wind Cable Corridor Constraints Assessment [Footnote 11: For a list of specific cable siting principles refer to Section 4.1 in the Onshore Wind Cable Corridor Constraints Assessment at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/O?shore-Wind/2306-O?shore-Wind-Cable-Corridor-Constraints-Assessment--completeacc.pdf.] associated NYS Public Service Commission orders and the results of other state and ISO/RTO transmission planning processes to maximize the utility of Points of Interconnection (POIs). Lessees considering landfall in New Jersey should also comply with the results of the state agreement approach (SAA) [Footnote 12: https://www.nj.gov/bpu/pdf/boardorders/2022/20221026/8A%20ORDER%20State%20Agreement%20Approach.pdf.] and any other future procurements resulting from similar initiatives. Previously Applied as a COP T&C: Category: T/E D V BACP Comment: Coordination of transmission infrastructure should be guided by the	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0371-0050-d

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	soliciting state agencies. Placing this obligation on the lessee is overly burdensome and infeasible. There are technological and regulatory challenges that cannot be resolved by the lessees alone. The separation of transmission and generation by relocating the POI offshore is essential to enable coordination of transmission infrastructure. ISOs and RTOs should be coordinating with the states to issue solicitations seeking coordinated transmission solutions. In addition given the competitive nature of the industry for both OREC awards and POIs it is not feasible to coordinate infrastructure at the initial planning stages. Shared corridors are being developed by NYS for future projects and are not yet proposed. For current projects corridors were developed with proprietary information and OREC awards were made based on specific landfall locations and POIs. In addition BOEM recognizes that they cannot dictate that a lessee use a shared cable corridors and that developing such a corridor would likely not be technically or economically practicable. In the New England Wind FEIS BOEM fully explains why they did not consider a shared transmission corridor for detailed analysis: "BOEM cannot dictate that a lessee uses a shared cable corridor that does not already exist (30 CFR 585.200(b)). BOEM has no way of determining if the use of a future shared cable corridor would be a technically and economically practical and feasible alternative for the proposed Project. Therefore BOEM cannot require the applicant to use a non-existent shared cable corridor for the proposed Project. Furthermore the proposed Project's export cables would connect to the power grid via different points of interconnection than other offshore wind projects located near Rhode Island Connecticut and Massachusetts (e.g. South Coast Wind). Developing a shared export cable corridor would not likely be technically or economically practicable because each other offshore wind project has distinct interconnection points to the electric power grid." [Footnote 13: New England Wind Project Final Environmental Impact Statement DOI BOEM 2024]Finally the PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. As Alternative C assumes adoption of all AMMMs as terms and conditions of plan approval for the purposes of the PEIS analysis these AMMMs are not in fact	

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	voluntary. Adoption of voluntary AMMMs through terms and conditions undermines the very voluntary nature of those measures.	
BOEM-2024-0001-0352-0008-g	MUL-18: Shared transmission corridor We strongly support this concept as it has the potential to meaningfully reduce negative impacts of offshore wind energy projects on the environment and on mobile bottom tending fisheries. However we are concerned that the phrasing used in Appendix G provides too much flexibility to be meaningful (e.g. "where practicable" and "where possible"). It is also noteworthy that this AMMM measure is described as voluntary and has not been previously approved as a COP term and condition. BOEM must play a leadership role in requiring shared transmission if this concept is to become a reality.	MUL-18 is an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0439-0058	Measure ID: MUL-2 Measure Name: Anchoring plan Description: Lessees must submit an anchoring plan for all areas where anchoring is being used during construction operations and decommissioning to avoid or minimize impacts on sensitive habitats including hardbottom and structurally complex habitats. The plan will require that the Lessee consider any new data on benthic habitats and cultural resources to avoid/minimize impacts on these resources to the maximum extent practicable. The anchoring plan must include the planned location of anchoring activities sensitive habitats and locations seabed features potential hazards and any related facility installation activities such as cables WTGs and OSSs as appropriate. It will require all vessels deploying anchors to use whenever feasible and safe mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor. The Lessee must provide the anchoring plan to BOEM and BSEE to coordinate with NMFS for a 60-day review at least 120 days before anchoring activities and construction begins. The Lessee must resolve all comments on the anchoring plan to BOEM and BSEE's satisfaction before conducting any OCS seabed- disturbing activities that require anchoring. For operations and decommissioning the Lessee must provide proposed anchoring plats to BOEM and BSEE for review and concurrence before anchoring activities occur. The proposed anchoring plats must include avoidances identified above and as-placed anchor plats must be submitted to BOEM and BSEE within 90 days of completion of an	Thank you for your comment. The COP does not typically include specifics on where anchoring activities will occur relative to sensitive habitats identified through the EFH assessment and consultation. This level of detail is included in the anchoring plan to avoid or minimize impacts from turbidity and anchor placement on sensitive habitats, including hard-bottom and structurally complex habitats and as-placed anchoring plats. This level of detail is not only required during the construction phase, but also during maintenance conducted during the operational phase, and during decommissioning. The lessee can coordinate with BOEM and BSEE about the details and expectations for preparing a compliant anchoring plan.

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	activity (including during operations) or construction of a major facility component (e.g. buoys export cable installation WTG or OSS installation and interarray cable installation) or decommissioning to demonstrate that seabed-disturbing activities complied with avoidance requirements for seabed features and hazards archaeological resources and/or anomalies. As-placed plats must show the "as-placed" location of all anchors and any associated anchor chains and/or wire ropes and relevant locations of interest or avoidance on the seabed for all seabed-disturbing activities. The plats must be at a scale of 1 inch = 1000 feet (300 meters) with Differential GPS accuracy. Previously Applied as a COP T&C: Check Category: ACP Comment: Anchoring and potential impacts are a part of the seabed impact calculation that goes into the COP. Also "to BOEM and BSEE's satisfaction" is vague and does not define what is or is not acceptable. Further guidance is needed on what is acceptable and why it is not already covered under the seafloor impacts assessment in the COP. The section on operations is confusing and seems to include construction activities. What is needed for operations should be broken out separately.	
BOEM-2024-0001-0423-0025	MUL-21 would encourage the use of or upgrading/retrofitting to the best available technology including new and emerging technologies where practicable. Aside from voluntary measures not being appropriate for a PEIS this AMMM paints with too broad a brush as the cost of upgrading or retrofitting technology is not always supported by meaningful impact reduction. For example when considering the use of closed-loop cooling systems to reduce entrainment risks the Draft PEIS states under discharges/intakes that [italicized: "[b]ecause the potential for measurable impacts on marine mammal prey under Alternative B is anticipated to be small a change in impact levels is not anticipated."] Lastly it is unclear what this requirement adds to existing regulations at 30 CFR 585.621(e) which requires that the COP uses the best available and safest technology. Therefore this measure should be removed or at least revised to assess affordability and applicability of new technology.	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. MUL-21 is an RP that encourages lessees to adopt new and emerging technologies.
BOEM-2024-0001-0439-0068	Measure ID: MUL-21 Measure Name: Use of new and emerging technology [Footnote 14: Appendix B Supplemental Information and Additional Figures and Tables Section B.9 describes examples of new	Please refer to response to comment BOEM-2024-0001-0423-0025.

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	and emerging technologies that Lessees could research and consider for adoption as part of MUL-21.]Description: Where practicable Lessees are encouraged to employ best available technology or other measures to avoid or minimize potential impacts in both offshore and nearshore environments including adopting new and emerging technologies. Examples include the use of jet plows closed loop cooling systems trenchless technology gravity-based structures or foundation designs that do not rely on pile-driving and MERLIN radar systems. In addition Lessees should explore opportunities to upgrade/retrofit equipment to the best available technology if it becomes available during project operations. Previously Applied as a COP T&C: Category: V D GACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. This measure is also completely duplicative of BOEM regulations at 30 CFR 585.621 (e) which requires that an applicant demonstrate that the COP uses the best available and safest technology. Best available and safest technology is defined in 30 CFR 585.113 as the "best available and safest technologies that BOEM determines to be economically feasible wherever failure of equipment would have a significant effect on safety health or the environment." This measure therefore duplicates the existing regulatory requirement without the regulatory safeguard of economic feasibility and without needing to demonstrate that failure of equipment would have a significant effect on safety health or the environment. In addition the evaluation of other alternative technologies to what is proposed in a COP can be done through the alternatives analysis in a COP specific NEPA document. This would go through the existing BOEM processes including alternative screening criteria to ensure alternatives analyzed are technically and economically feasible. Furthermore in the New England Wind FEIS a proposed alternative that would include "Project modifications as well as emerging technologies and methodologies" was not considered but not analyzed in detailed because BOEM determined that it was "vague speculative and does not address a specific significant impact or concern or provide sufficient detail to meaningfully analyze impacts." [Footnote 15: New England Wind Project Final Environmental Impact Statement DOI BOEM 2024] If a	

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	very similar alternative was deemed too vague and speculative to meaningfully analyze impacts then this AMMM must also be removed from consideration as there is no way to meaningfully analyze how this mitigation measure will reduce impacts. For these reasons this measure is duplicative vague and highly inappropriate as a mitigation measure and should be removed. If BOEM would like to change the regulatory requirements around use of best available technology or provide clarification on those provisions they should go through the appropriate process for changing regulations or establishing new guidance. This process should include outreach to industry and public review and comment.	
BOEM-2024-0001-0450-0019	G. MUL-21 Use of New and Emerging Technology In order to evaluate all avian impacts from offshore wind farms integration of multiple technologies will be necessary for measuring four key variables: (1) direct collision rates (2) micro-avoidance behavior (3) meso-avoidance behavior and (4) macro-avoidance behavior. [Footnote 83: Skov H Heinnen S Norman T Ward R Mndez S. 2018. ORJIP Bird avoidance behaviour and collision impact monitoring at offshore wind farms. The Carbon Trust: London UK. 127 pp.] With all of these parameters it should be possible to comprehensively estimate (model) collision impacts to birds. An ideal single integrated monitoring system should have diverse components such as radar (horizontal and vertical) cameras (still video and/or thermographic) acoustic recording and detection of acoustically-signaled biologging or geo-tracking devices and collision detection. We strongly urge BOEM to require such integrated monitoring systems when and as the technology becomes sufficiently mature standardized and commercially available.	Please refer to response to comment BOEM-2024-0001-0423-0025. The list of examples in MUL-21 is not exhaustive; however, the language was updated to include information about integrated monitoring systems.
BOEM-2024-0001-0450-0085	Measure ID and Name: MUL-21 Use of New and Emerging Technology Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): Where practicable Lessees are encouraged to employ best available technology or other measures to avoid or minimize potential impacts in both offshore and nearshore environments including adopting new and emerging technologies. Examples include the use of jet plows closed loop cooling systems trenchless technology gravity-based structures or foundation designs that do not rely on	Please refer to response to comment BOEM-2024-0001-0423-0025. The list of examples in MUL-21 is not exhaustive; however, the language was updated to include information about integrated monitoring systems.

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	piledriving and MERLIN radar systems. In addition Lessees should explore opportunities to upgrade/retrofit equipment to the best available technology if it becomes available during project operations. **Notes:** • Integration of multiple technologies will be necessary to evaluate all avian impacts from offshore wind farms including measuring direct collision rates micro-avoidance behavior meso-avoidance behavior and macro-avoidance behavior. • Comprehensive estimation of collision impacts to birds can be achieved by integrating diverse components into an ideal single integrated monitoring system such as radar (horizontal and vertical) cameras (still video and/or thermographic) acoustic recording and detection of acoustically-signaled biologging or geo-tracking devices and collision detection. We strongly urge BOEM to require such integrated monitoring systems when the technology becomes sufficiently mature standardized and commercially available.	
BOEM-2024-0001-0469-0017	AMMM measure MUL-21 would encourage OSW developers to adopt and upgrade to new technologies when practicable. This measure is voluntary though it is characterized elsewhere in the Draft PEIS as a requirement. [Footnote 64: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 at 3.4.2-23.] BOEM presents this measure as a way to mitigate the negative environmental impacts of once-through cooling systems expected in offshore substations for OSW; however it is far from certain that closed-loop technology will become available in the foreseeable future. [Footnote 65: Id. at 3.4.2-23-24; see supra Part V.] At the very least adopting new less environmentally impactful technologies must be mandatory when practicable.	Please refer to response to comment BOEM-2024-0001-0423-0025. MUL-21 is an RP that encourages lessees to adopt new and emerging technologies, including potential new closed-loop technology as it becomes available.
BOEM-2024-0001-0352-0008-h	MUL-21: Use of new and emerging technologies We generally support this AMMM measure; however its description is overly broad which poses challenges for understanding what specific measures may be implemented by BOEM at this stage in the process.	MUL-21 was updated with new and emerging technologies proposed in comments received during scoping and on the Draft PEIS. MUL-21 is an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.

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BOEM-2024-0001-0422-0008	MUL-23 Adjust project design to reduce impacts. Comment #6 on MUL-23 The breadth of this AMMM makes it almost impossible to interpret and implement successfully. As written this AMMM is unclear but appears to be unreasonably burdensome; and therefore Attentive Energy recommends that this AMMM should be deleted. If it is determined that this AMMM be retained for the Final PEIS some questions that may clarify this proposed AMMM include: • What is meant by "consider all potential WTG positions to allow flexibility in project design"? • What "marine mammal vessel strike models" should be considered? Overall as the purpose of the COP and EIS process is to identify and avoid minimize and mitigate potential impacts to important environmental and social resources making the identification of a specific AMMM to do the same is unnecessarily redundant.	Thank you for your comment. MUL-23 is an RP and the language was updated to highlight existing guidelines (Information Guidelines for a Renewable Energy Construction and Operations Plan Best Management Practices [Attachment A, https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines_Technical_Corrections.pdf]). Suggestions that were duplicative of those guidelines were removed, and remaining suggestions were left as additional considerations.
BOEM-2024-0001-0439-0070	Measure ID: MUL-23 Measure Name: Adjust project design to reduce Impacts Description: Lessees must consider how to avoid or reduce potential impacts on important environmental resources including sensitive habitats (e.g. Mid-Shelf Scarp NJDEP-designated prime fishing grounds hardbottom SAV ledges) by adjusting project design. Lessees must demonstrate this consideration through their initial COP submission or subsequent updated versions. At a minimum project design adjustment considerations must include: Utilizing shared cable crossing positions to reduce the overall seabed footprint and quantity of any additional cable protection materials; Using cable installation methods such as horizontal directional drilling that avoid and minimize adverse impacts on sensitive habitats and difficult-to-replace resources; Avoiding routing export cables through estuaries and embayments to reduce impacts on numerous sensitive habitats and difficult-to-replace resources as well as many sensitive life stages of various species; Ensuring all mooring systems and ancillary equipment are contained inside the approved lease area to reduce impacts on fishing navigation and other uses; Adjusting turbine layout or co-locating ancillary equipment to avoid sensitive habitats; Using outputs from marine	Please refer to response to comment BOEM-2024-0001-0422-0008. MUL-23 was updated to highlight existing guidelines (Information Guidelines for a Renewable Energy Construction and Operations Plan Best Management Practices [Attachment A, https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines_Technical_Corrections.pdf]), suggestions that were duplicative of those guidelines were removed, and remaining suggestions were left as additional considerations.

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	mammal vessel strike models to inform project design; Considering all potential WTG positions to allow for flexibility in project design due to identification of sensitive habitats or cultural properties through the environmental review process; and Using micrositing as a tool for identifying and avoiding sensitive habitats. Previously Applied as a COP T&C: Category : G DACP Comment: The inclusion of this measures is counter to the proposed action which states that "BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective." The PEIS intends to analyze measures that can be approved as terms and conditions of plan approval for individual project specific COPs. How would this be implemented through a term and condition of plan approval? How would this work with already established processes such as the "Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operations Plans pursuant to the National Environmental Policy Act?" Why is a new process being developed here and is it meant to circumvent the process for identifying alternatives which emphasize project feasibility and meeting the purpose and need? These measures are best addressed during project specific environmental reviews utilizing the process for identifying alternatives established by BOEM. Technical and economic viability could then be factored in. For example: Given the competitive nature of the industry for both OREC awards and POIs it is not feasible to coordinate infrastructure at the initial planning stages. Shared corridors are being developed by NYS for future projects and are not yet proposed. For current projects corridors were developed with proprietary information and OREC awards were made based on specific landfall locations and POIs. The need to Microsite for sensitive habitats and cultural properties should be deferred to individual project NEPA processes. For these reasons this measure is duplicative and highly inappropriate as a mitigation measure and should be removed.	
BOEM-2024-0001-0423-0026	[bold: MUL-23] and [bold: MUL-24] would formalize the assumption that lessees should adjust project design to reduce impacts even to the extent of removing turbine positions. Even more directly and	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that

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	alarmingly the summary of this measure in Chapter 3 Table 3.6.1-20 reads only [italicized: "[t]his measure proposes that where practicable developers avoid or reduce potential impacts on important environmental resources by adjusting project design."] Other measures in these AMMMs offer concrete options to consider but it is not appropriate for a PEIS to include any requirement that would remove turbine positions without a clear justification based on a project-specific proposal. Project design is evaluated during the review process and approved at ROD. These AMMMs (amongst many others) are not enforceable terms and conditions of a COP.	have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. MUL-23 has been classified as an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. MUL-24 has been deleted because it is covered in other AMMM measures and through consultations.
BOEM-2024-0001-0347-0004-b	MUL-23: While ASGA wholly prefers avoiding complex and sensitive habitats earlier in the lease identification processes we maintain our support for utilizing this AMMM's strategies to further minimize and avoid impacts in offshore and inshore ecosystems.	Thank you for your comment.
BOEM-2024-0001-0352-0008-i	MUL-23: Adjust project design to reduce impacts We support this AMMM measure; however it is unclear how it could be effectively implemented at this stage rather than during the review of project-specific construction and operations plans. We are also concerned that this AMMM measure will have limited effectiveness given that it requires consideration of how to reduce impacts but does not appear to require any specific actions.	Thank you for your comment. MUL-23 has been classified as an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0406-0018-b	MUL-23 which would require lessees to "consider how to avoid or reduce potential impacts on important environmental resources including sensitive habitats [...] by adjusting project design." It is unclear how a lessee could ever know when they have engaged in enough impact avoidance or reduction to comply with this obligation how agencies would exercise their enforcement discretion or how this is an appropriate condition of COP approval when compliance must be demonstrated "through [the] initial COP submission or subsequent updated versions."	Thank you for your comment. MUL-23 has been classified as an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.
BOEM-2024-0001-0422-0009	MUL-24 Adaptive management for NMFS Trust Resources Comment #7 on MUL-24The breadth and lack of clarity of this AMMM make it nearly impossible for developers to implement; and therefore Attentive Energy recommends that this AMMM should be deleted. The purpose of the offshore wind permitting process is to identify avoid minimize and mitigate environmental risks from the leasing process through the EIS to the COP approval. Given this extensive	Thank you for your comment. After further consideration, MUL-24 has been deleted because it is covered in other AMMM measures and through consultations.

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	review process which takes into account decades of global offshore wind development experience environmental risks are identified planned for and mitigated. Currently per existing COP approvals there are post-construction monitoring plans already required for each project and these plans have been developed to address the likely future impacts and as such are sufficient without an additional adaptive management plan that would hypothesize future impacts. Hypothesizing now "unanticipated issues" is a premature exercise and unnecessary conjecture given the extensive pre- and post-construction review and monitoring required. It is not appropriate for each offshore wind project to "define thresholds above which environmental impacts would be deemed unacceptable" as this is inherently a government responsibility. If BOEM believes there are unacceptable impacts associated with a project it should define and manage those through the EIS and COP approval and not ask a developer to do so. Further Attentive Energy finds that it would be challenging to define environmental thresholds now for "unanticipated issues" without having those issues in some way defined and anticipated. BOEM already requires adherence to time of year restrictions and it is unclear why this requirement needs to be restated in this AMMM. Consideration of a "no-build migratory routing measure" is best done across projects and therefore by the government it should not be the responsibility of each project. BOEM should provide a statutory or regulatory reference to support the use of the term "precautionary principle" in this AMMM. If no such reference exists then the term should be deleted. Finally it is unclear how BOEM would approve any adaptive management plan and what would be BOEM's timeframe for review/approval. The use of the wording "must develop" and "be finalized prior to construction activities being initiated" is unspecific and represents a potential delay risk to project schedule with associated unknown future costs.	
BOEM-2024-0001-0423-0008	[bold: MUL-24] would require lessees to develop an adaptive management plan to resolve unanticipated issues and integrate new information (seemingly ahead of construction start). It states that the plan should include the consideration of no-build migratory routing measures for protected species including the North Atlantic	Thank you for your comment. After further consideration, MUL-24 has been deleted because it is covered in other AMMM measures and through consultations.

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	right whale (NARW) (i.e. removing turbines) and implementing the "precautionary principle for sensitive habitats" including setbacks from spawning areas fishery rotational and access management areas and other critical habitat. It is imperative that lessees have certainty at the ROD stage. Creating such certainty is a key purpose for a NEPA ROD and it is used to support the financing needed to construct the project. MUL-24 takes away needed certainty by leaving open the possibility that the project design could be significantly altered after the conclusion of the NEPA process. The certainty that flows from ROD issuance provides assurance not just to the lessee but also to the financial institutions like banks who must commit billions of dollars to these clean energy projects prior to construction. Removing legally required certainty by contemplating plans that would cause a material change to the design and energy production of the project after ROD is issued is tantamount to cutting off the flow of funds to climate-protecting projects at a critical juncture. Further this provision of the Draft PEIS inappropriately invokes the Endangered Species Act (ESA) and Marine Mammal Protection Act in a manner contrary to the Appeals Court decision in [italicized: Maine Lobstermen's Association v. National Marine Fisheries Service (MLA v. NMFS] No. 22-5238 (D.C. Cir. 2023)) by invoking the prospect of action premised on the "precautionary principle." The D.C. Circuit decision in [italicized: MLA v. NMFS] made it plain that the agency must meet the statutory standard of making decisions based on proven and tested science not on speculative hypotheses that are characterized as "applying the precautionary principle. "Moreover this provision contemplates including elements in an "adaptive management plan" that can and should not be included such a plan as doing so would be to twist the meanings of the words "adaptive management" substantially. Suggested mitigations contemplated in this section such as the prospect of removal of turbines are about project design. Putting them into an "adaptive management" plan would be inappropriate as adaptive management should be implemented by observing real conditions and actively adapting the management of the facility. A re-review of mitigations at the end of the regulatory process as contemplated by the Draft PEIS is inappropriate. An appropriate	

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	adaptive management plan would be a framework not a prescriptive set of measures. The goal of such a plan must be (as the name suggests) to have a plan in place to potentially modify the management and operation of the facility to adapt to newly observed conditions. Matters like setbacks and placement (including the addition or removal) of wind turbines are not appropriate subject matter for an adaptive management plan but instead are elements of the project design and environmental review that plays out through documents that include: the COP the DEIS the FEIS the Fabrication and Installation Report and the Facility Design Report.	
BOEM-2024-0001-0439-0071	Measure ID: MUL-24 Measure Name: Adaptive management for NMFS Trust Resources Description: Lessees must develop an adaptive management plan to resolve unanticipated issues and integrate new information. The adaptive management plan must be finalized prior to initiating construction activities. This plan should include the following: Defining thresholds above which environmental impacts would be deemed unacceptable and how adaptive management will be implemented for review and approval by BOEM and BSEE; Adhering to all relevant Time of Year Restrictions (TOYRs) for protected species present in the area and minimizing impacts if work must occur within TOYRs; Considering no-build migratory routing measures for protected species already under threat including for the NARW; and Implementing the precautionary principle for sensitive habitats including setbacks from important spawning areas fishery rotational and access management areas and other critical habitat. Previously Applied as a COP T&C: Category: DACP Comment: This provision contemplates including elements in an "adaptive management plan" that cannot and should not be included in such a plan. Suggested changes in projects contemplated in this section (like the prospect of removal of turbines) are about project design and putting them into an "adaptive management" plan would be inappropriate. Adaptive management should be about observing real conditions and actively adapting the management of the facility it cannot be a re-review at the end of the regulatory process which the PEIS seems to contemplate. An appropriate Adaptive Management Plan would be a framework not a prescriptive set of measures. The goal of such a plan must be as the name	Thank you for your comment. After further consideration, MUL-24 has been deleted because it is covered in other AMMM measures and through consultations.

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	suggests to have a plan in place to potentially modify the management and operation of the facility to adapt to newly observed conditions. Matters like setbacks placement (including the addition or removal) of wind turbines are not appropriate for an Adaptive Management Plan but instead are elements of the project design and extensive project and environmental review processes. BOEM's planning and leasing process identifies areas most suitable for offshore wind development. Wholesale removal of areas at the COP stage based off proximity to sensitive habitats is not appropriate or justified. ACP is also concerned about proposing setbacks from sensitive habitat whose identification can be very subjective. A prime example is the Cod Spawning HAPC which has been proposed without concrete evidence or data and is highly speculative. For more details on the subjective nature of this HACP see ACPs comments on the draft cod spawning HAPC.16 In addition rotational areas are adaptive by design inappropriate for creating removals or buffers from areas that are not fixed. We strongly believe that the precautionary principle should not be used for the development of mitigation measures. All mitigation should be developed based upon best available information. Furthermore the DC Circuit Court of Appeals has ruled that the use of the precautionary principle is illegal in the case of the Maine Lobsterman's Association v. National Marine Fisheries Service. The opinion states that "Here the Service misconceived the law wrongly claiming the legislative history of the ESA had ordained if legislative history could ever ordain a precautionary principle in favor of the species. The Service therefore gets no deference [a]nd its action cannot stand." [Footnote 17: MLA v NMFS 70 F.4th 582 p. 25 (D.C. Cir. 2023)] Furthermore the court clarifies that "..when the Congress wants an agency to apply a precau[ti]onary principle it says so." [Footnote 18: MLA v NMFS 70 F.4th 582 p. 28 (D.C. Cir. 2023)] Congress has not specified that BOEM BSEE or NMFS may apply a precautionary principle and therefore the use of such a principle is not only inappropriate but in violation of the law. BOEM should remove the reference to the precautionary principle from this measure and should ensure that mitigation measures are not written in the spirit of the precautionary principle. Mitigation measures should only be developed when there	

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	is clear evidence of an impact and the measure would reduce the effects of that impact in a measurable manner.	
BOEM-2024-0001-0450-0070	Measure ID and Name: MUL-24: Adaptive management for NMFS Trust Resources Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "Lessees must develop an adaptive management plan to resolve unanticipated issues and integrate new information. The adaptive management plan must be finalized prior to initiating construction activities [Underline: and must address adaptive management during the construction phase and the operations phase of offshore wind development]. This plan should include the following: • [Strikethrough: Defining] [Underline: T]hresholds [Underline: as defined by NMFS and BOEM] above which environmental impacts would be deemed unacceptable; • [Underline: H]ow adaptive management will be implemented [Underline: by the lessee] for review and approval by BOEM and BSEE; • Adhering to all relevant Time of Year Restrictions (TOYRs) for protected species present in the area and minimizing impacts if work must occur within TOYRs; • Considering no-build migratory routing measures for protected species already under threat including for the NARW; and • Implementing the precautionary principle for sensitive habitats including setbacks from important spawning areas fishery rotational and access management areas and other critical habitat.[Underline: BOEM will periodically analyze post-installation monitoring data and convene expert workshops for further review."] Notes: We support BOEM's requirement that lessees apply adaptive management to offshore wind planning and construction. We recommend that BOEM clarify in MUL-24 that adaptive management planning must apply to the operations stage of offshore wind development in addition to the construction stage. We also recommend that BOEM clarify that "defining thresholds above which environmental impacts would be deemed unacceptable" is the role	Thank you for your comment. After further consideration, MUL-24 has been deleted because it is covered in other AMMM measures and through consultations.

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	of regulatory agencies (i.e. NMFS and BOEM) and not the role of the developer. Additionally we recommend that BOEM commit to periodic independent analysis of the data produced through post-installation monitoring and to holding one or more expert workshops for additional review and reflection.	
BOEM-2024-0001-0406-0018-c	MUL-24 which would require the submittal of an "adaptive management plan" to be finalized after COP approval and which includes implementation of "the precautionary principle for sensitive habitats." At minimum this obligation would contravene the D.C. Circuit's ruling in Maine Lobstermen's Association v. NMFS that the Endangered Species Act does not codify the precautionary principle in favor of the species. 70 F.4th 582 597-98 (D.C. Cir. 2023). [Footnote 6: We also note that the proposed "no build" requirement for the North Atlantic right whale's migratory routes would potentially prevent any wind farm construction in the NY Bight as the entire coast is used for NARW migration.]	Thank you for your comment. After further consideration, MUL-24 has been removed.
BOEM-2024-0001-0422-0011	MUL-26 Monitoring Plan Comment #9 on MUL-26 This AMMM's lack of clarity makes it difficult and potentially unreasonable to implement. It is unclear what is meant by "This monitoring plan should cover resources that are not covered by other resource-specific monitoring plans". Attentive Energy asks BOEM to provide a comprehensive list of all other resources that are not covered under existing monitoring plans and would need to be addressed through this AMMM. If other resources should be covered under a monitoring plan Attentive Energy recommends that BOEM should specify those resources and require a plan. It is not appropriate to ask each project to hypothesize what resources are not but should be covered under a monitoring plan. This measure is overly broad and should be removed as an AMMM as it is believed all important resources are already covered by specific monitoring plans.	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. MUL-26 was updated to reflect that this RP does not require an additional plan or additional monitoring. Instead, this RP encourages lessees to coordinate their monitoring plans if applicable; follow guidance from ROSA, RWSC, and NMFS/BOEM; and make results publicly available.
BOEM-2024-0001-0423-0009	[bold: MUL-26] would require a monitoring plan to cover all potentially impacted [italicized: "resources that are not covered by other resource-specific monitoring plans."]This is an extremely broad directive that is not supported by data. It is impractical to require lessees to monitor every resource that could possibly be indirectly impacted by offshore wind. Requirements for monitoring plans	Thank you for your comment. Please see response to comment BOEM-2024-0001-0422-0011, which indicates that this RP does not require an additional plan or additional monitoring.

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	should be specific and focused on issues and/or target species determined to be potentially most impacted by the project after BOEM's project-specific NEPA review.	
BOEM-2024-0001-0446-0006	Separate and individualized monitoring plans for projects that are all located in the same vicinity misses the opportunity to detect and mitigate change and impacts and deliver benefits to the resources that are moving across the lease areas. Designing a single monitoring project of a specific resource that interacts with offshore wind projects across all six lease areas may provide the best view into whether there are species or habitat-specific cumulative impacts to mitigate and coordinated biodiversity net-positive projects that could increase benefits. AMMM measure MUL- 26 encourages "coordination of monitoring efforts across lease areas in the NY Bight to maximize efficiencies in monitoring efforts especially at a regional scale." See MUL-26 at G-22. But the goal of coordinating monitoring efforts should not only be to "maximize efficiencies." Coordination of monitoring and standardization of approaches across the six lease areas is fundamental to our ability to actually detect change and adaptively manage across an ecosystem. Indeed this is the point of a six-lease area PEIS focused on identifying and coordinating AMMM measures. For this reason the inclusion of MUL-26 as a "highly encouraged" AMMM measure is not alone enough to support identification and adaptation of effective ecosystem-wide AMMM measures.	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action. MUL-26 was updated to reflect that this RP does not require an additional plan or additional monitoring. Instead, this RP encourages lessees to coordinate their monitoring plans if applicable; follow guidance from ROSA, RWSC, and NMFS/BOEM; and make results publicly available.
BOEM-2024-0001-0406-0024	vii. Measures That are Duplicative and/or Internally Inconsistent Several of BOEM's proposed AMMM measures have the additional flaw of being duplicative of or inconsistent with other measures proposed both within the Draft PEIS and other expected agency approvals a project will receive. This duplication and inconsistency is problematic for three primary reasons. First compliance with multiple measures that have the same substantive purpose wastes developer and agency resources. Second duplicative and inconsistent measures create considerable project and legal risk by imposing potentially divergent standards and requirements. Third duplicative and inconsistent measures create challenges for developers in demonstrating compliance. Some examples of the duplicative or inconsistent measures included in the Draft PEIS include: MUL-26	Thank you for your comment. We have reconciled duplicative measures. MUL-36 and MUL-38 were deleted. MMST-13 was removed and incorporated into MMST-14 and MM-5. MUL-26 was updated to clarify that a new plan is not required.

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	requiring an "environmental monitoring plan" that is overly vague and duplicative of numerous preexisting environmental monitoring requirements (e.g. BB-3 COMFIS-3) MUL-36 requiring visual vessel strike monitoring that is both duplicative of and potentially inconsistent with MM-5 (NARW strike management plan) MMST-13 (vessel speed requirements) and MMST-14 (vessel strike mitigation measures); MUL-38 requiring a noise mitigation plan that is duplicative of many marine mammal and sea turtle measures (e.g. MMST-4 MUL-5 MUL-6 MUL-7). To avoid these unnecessary risks BOEM must eliminate duplication and inconsistency in the final list of potential AMMM measures in the PEIS.	
BOEM-2024-0001-0347-0004-c	MUL-26: Monitoring plans are foundational to effective OSW development and must be scientifically sound to accurately assess and analyze impacts. ASGA agrees with BOEM that monitoring plans should be coordinated across other NY Bight leases and the results should be made public. However we recommend that monitoring plans also be coordinated to other leases outside of the NY Bight to encourage more standardized plans and data collection activities. Additionally where possible monitoring plans should utilize fishermen to assist in the completion of this work and address key concerns raised by fishing communities.	Thank you for your comment. The RP has been updated to encourage lessees to develop monitoring and survey plans that meet regional data requirements and standards.
BOEM-2024-0001-0439-0074	Measure ID: MUL-27 Measure Name: Minimize sediment disturbance Description: Lessees must employ methods to minimize sediment disturbance including but not limited to the use of midline buoys to prevent cable sweep not side-casting materials and removal and reuse of dredged material for backfill or other beneficial use. Previously Applied as a COP T&C: Category: T/EACP Comment: This measure needs to be qualified with the following language: if technically and economically viable.	Thank you for your comment. MUL-27 is an RP and has been updated with caveat language.
BOEM-2024-0001-0439-0077	Measure ID: MUL-32 Measure Name: Daily weekly and final PSO reporting requirements (including foundation pile- driving) Description: PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to effectively monitor the area of the clearance and shutdown zones. Data fields must be reported in an electronic CSV format as daily reports during shutdowns and weekly reports during pile-driving and construction.	Thank you for your comment. BOEM will work with the lessees to remove Confidential Business Information prior to disseminating/publishing the raw weekly data.

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	Data categories must include Project Operations Monitoring Effort and Detection. Data must be generated through software applications or otherwise recorded electronically by PSOs. Applications developed to record PSO data are encouraged as long as the data fields listed below can be recorded and exported to Excel. Alternatively BOEM has developed an Excel spreadsheet with all the necessary data fields that is available upon request from BOEM. The third-party PSO providers must submit the daily (if applicable) and weekly monitoring reports to BOEM (renewable_reporting@boem.gov) NMFS (incidental.take@noaa.gov) and BSEE (submittals via TIMSWeb and notification email to protectedspecies@bsee.gov) every Wednesday during construction for the previous week (Sunday through Saturday) of monitoring of pile-driving activity. Daily PSO forms including electronic effort survey and sightings forms must be submitted to BOEM (renewable_reporting@boem.gov) monthly on the 15th day of each month for the previous calendar month of activities. Required data and reports may be archived analyzed published and disseminated by BOEM. The following should be included in PSO reports: Detection Information for Protected Species: Date (YYYY-MM-DD)Sighting ID (V01 V02 or sequential sighting number for that day) (multiple sightings of same animal or group should use the same ID)Date and time at first detection in UTC (YY-MM-DDT HH:MM) Time at last detection in UTC (YY-MM-DDT HH:MM)PSO name(s) (Last First)Effort (On = source on; Off = source off)Latitude (decimal degrees dd.ddddd) Longitude (decimal degrees dd.ddddd) Compass heading of vessel (degrees)Water depth (meters) Swell height (meters) Beaufort scale Precipitation Visibility (km) Cloud coverage (%) Glare Sightings including common name scientific name or family Certainty of identification Number of adults Number of juveniles Total number of animals Bearing to animal(s) when first detected (ship heading + clock face) Range from vessel (reticle distance in meters)Description (include features such as overall size; shape of head; color and pattern; size shape and position of dorsal fin; height direction and shape of blow)Detection narrative (note behavior especially changes in relation to survey activity and distance from source vessel)Direction of travel/first	

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	approach (relative to vessel)Behaviors observed: Indicate behaviors and behavioral changes observed in sequential order (use behavioral codes)If any bow-riding behavior observed record total duration during detection (HH:MM) Initial heading of animal(s) (degrees)Final heading of animal(s) (degrees) Source activity at initial detection Source activity at final detection (on or off)Shutdown zone size during detection (meters)Was the animal inside the shutdown zone? Closest distance to vessel (reticle distance in meters) Time at closest approach (UTC HH:MM)Time animal entered shutdown zone (UTC HH:MM) Time animal left shutdown zone (UTC HH:MM)If observed/detected during ramp up / power up: First distance (reticle distance in meters) Closest distance (reticle distance in meters) Last distance (reticle distance in meters) Behavior at final detection Shutdown or power-down occurrences Detections with PAM Monitoring Effort Information for Pile-Driving: Date Effort (On = source on; Off = source off)If visual how many PSOs on watch at one time? PSOs (Last First)Start time of observations End time of observations Duration of visual observation Wind speed (knots) from direction Beaufort scale Swell (meters)Water depth (meters) Visibility (km)Glare severity Block name and number Location: latitude and longitude. The daily report during shutdown (if applicable) must include the date time species pile identification number GPS coordinates time and distance of the animal when sighted time the shutdown or power-down occurred behavior of the animal direction of travel time the animal left the shutdown zone time the pile- driver was restarted or powered back up any photographs that may have been taken number of animals closest approach of animal to pile-driving distance of animal to pile-driving when shutdown was initially requested and total time animal spent in the shutdown zone. Weekly reports can consist of raw data. Required data and reports provided to BOEM and BSEE may be archived analyzed published and disseminated by BOEM. PSO data must be reported weekly every Wednesday during construction for the previous week (Sunday through Saturday) from the start of visual and/or PAM efforts during pile-driving activities and every week thereafter until the final reporting period upon conclusion of pile-driving activity. Any editing review and quality assurance checks	

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	must be completed only by the PSO provider prior to submission to NMFS BOEM and BSEE. The Lessee must submit to BOEM and BSEE at renewable_reporting@boem.gov for BOEM and via TIMSWeb and notification email to protectedspecies@bsee.gov for BSEE a final summary report of PSO monitoring 90 days following the completion of pile-driving. The following required data fields for the final PSO report should include: Project Information: Project name Lease number State coastal zones PSO contractor(s) Vessel name(s) Reporting date(s)Visual monitoring equipment used (e.g. bionics magnification IR cameras etc.) Distance finding method used PSO names (last first) and training Observation height above sea surface Operations Information: Date (YYYY-MM-DD)Hammer type used (make and model) Greatest hammer power used for each pile Pile identifier and pile number for the day (e.g. pile 2 of 3 for the day) Pile diameters Pile length Pile locations (latitude and longitude) Monitoring Effort Information: Date (YYYY-MM-DD)Noise source (On = hammer on; Off = hammer off) PSO name(s) (Last First)If visual how many PSOs on watch at one time? Time pre-clearance visual monitoring began in UTC (HH:MM) Time pre-clearance monitoring ended in UTC (HH:MM)Time pre-clearance PAM monitoring began in UTC (HH:MM) Time PAM monitoring ended in UTC (HH:MM)Duration of pre-clearance visual and PAM monitoring Time power up/ramp up began. Time equipment full power was reached Duration of power up/ramp up. Time pile-driving began (hammer on)Time pile-driving activity ended (hammer off) Duration of activity. Duration of visual observation Wind speed (knots) from direction Swell height (meters)Water depth (meters) Visibility (km)Glare severity. Latitude (decimal degrees) longitude (decimal degrees) Compass heading of vessel (degrees)Beaufort scale Precipitation Cloud coverage (%)Did a shutdown/power-down occur? Time shutdown was called for (UTC) Time equipment was shut down (UTC) Record any habitat or prey observations Record any marine debris sighted. Detection Information: Date (YYYY-MM-DD)Sighting ID (V01 V02 or sequential sighting number for that day) (multiple sightings of same animal or group uses the same ID)Date and time at first detection in UTC (YY-MM-DDT HH:MM) Time at last detection in UTC (YY-MM-DDT HH:MM)PSO name(s) (Last First)Effort (On = hammer	

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	on; Off = hammer off)If visual how many PSOs on watch at one time? Start time of observations. End time of observations Duration of visual observation. Wind speed (knots) from direction Swell height (meters)Water depth (meters) Visibility (km)Glare severity. Latitude (decimal degrees) longitude (decimal degrees) Compass heading of vessel (degrees)Beaufort scale Precipitation Cloud coverage (%)Sightings including common name scientific name or family. Certainty of identification. Number of adults Number of juveniles Total number of animals. Bearing to animal(s) when first detected (ship heading + clock face) Range from vessel (reticle distance in meters)Description (include features such as overall size; shape of head; color and pattern; size shape and position of dorsal fin; height direction and shape of blow etc.)Detection narrative (note behavior especially changes in relation to survey activity and distance from source vessel)Direction of travel/first approach (relative to vessel)Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes)If any bow-riding behavior observed record total duration during detection (HH:MM) Initial heading of animal(s) (degrees) Final heading of animal(s) (degrees)Shutdown zone size during detection (meters) Was the animal inside the shutdown zone? Closest point of approach to pile-driving operation (reticle distance in meters) Time at closest approach (UTC HH:MM)Time animal entered shut-down zone (UTC HH:MM) Time animal left shut-down zone (UTC HH:MM)If observed/detected during ramp up/power up: first distance (reticle distance in meters) closest distance (reticle distance in meters) last distance (reticle distance in meters) behavior at final detection. Did a shutdown/power-down occur? Time shutdown was called for (UTC) Time equipment was shut down (UTC)Reason shutdown was not implemented Previously Applied as a COP T&C: Check Category: ACP Comment: "Required data and reports provided to BOEM and BSEE may be archived analyzed published and disseminated by BOEM." Agencies must work with the lessees to remove Confidential Business Information prior to disseminating/publishing the raw weekly data. This was committed to in the past.	

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BOEM-2024-0001-0347-0004-d	MUL-35: Monthly/annual reporting requirements We support this AMMM measure and request that the associated reports be made available to the public.	Thank you for your comment. MUL-35 was deleted and incorporated into MUL-32. BOEM may consider making the associated reports available to the public.
BOEM-2024-0001-0423-0010	[bold: MUL-36] would require trained protected species observers or alternative monitoring on [italicized: all vessels while operating within US Exclusive Economic Zone.] This measure includes vessels traveling from Europe or other regions. At the very least this measure would cause direct project delays and add to the complexity and cost of construction and burdening of electricity customers. Further no other maritime industry is being tasked with this condition. Burdening offshore wind with considerable additional obligations without demonstrating any impact reductions that would come from offshore wind alone being subject to this requirement would be unjustified. More moderate steps like certifying crew members as Strike Avoidance Observers should be studied and potentially applied to other maritime industries.	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. MUL-36 has been deleted and incorporated into MMST-14, which only applies to construction, operation, and decommissioning.
BOEM-2024-0001-0423-0027	[bold: MUL-36] would require trained protected species observers or alternative monitoring on [italicize: all vessels while operating within US Exclusive Economic Zone.] This includes vessels traveling from Europe or other regions. At the very least this measure would cause project delays and add to the complexity and cost of construction. No other industry is being tasked with this condition and it burdens offshore wind with considerable additional costs without demonstrating any impact reductions that would come from the offshore wind industry (which represents a small percent of OCS vessel traffic) exclusively being subject to this requirement. More moderate steps like certifying crew members as Strike Avoidance Observers should also be studied and potentially could be applied to all industries.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0423-0010 regarding MUL-36.
BOEM-2024-0001-0439-0078	Measure ID: MUL-36 Measure Name: Visual vessel strike monitoring Description: Lessees must require visual vessel strike monitoring of protected species for all vessels while operating within US EEZ waters. This includes vessels traveling from Europe or other regions in which visual monitoring is conducted for vessel strike avoidance when the vessel is within the US EEZ boundary. This can include the use of trained observers onboard the vessel or alternative monitoring such as IR camera systems with the possibility of remote	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0423-0010 regarding MUL-36.

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	monitoring for systems with established and documented efficacy. Previously Applied as a COP T&C: Category: BACP Comment: This measure applies a requirement on the offshore wind industry that doesn't apply to any other marine industry. Offshore wind vessels represent only 2% of ship traffic on the OCS. The other 98% of vessels will not be required to have visual vessel strike monitoring when operating in the US EEZ. Therefore this measure would have a negligible benefit if any to marine mammals and would not result in a discernable lower risk of vessel strikes. However this measure would result in a significant burden to the offshore wind industry and would result in increased costs and an increase in human safety risk.	
BOEM-2024-0001-0450-0072	Measure ID and Name: MUL-36: Visual vessel strike monitoring Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "Lessees must require visual vessel strike monitoring of protected species for all vessels while operating within US EEZ waters. This includes vessels traveling from Europe or other regions in which visual monitoring is conducted for vessel strike avoidance when the vessel is within the US EEZ boundary. This [Strikethrough: can] [Underline: must] include the use of trained observers onboard the vessel [Strikethrough: or] [Underline: which may be supplemented by][Strikethrough: alternative] [Underline: other] monitoring such as IR camera systems. [Strikethrough: with the possibility of remote monitoring for systems with established and documented efficacy."] Notes: We support MUL-36's requirement that lessees require visual vessel strike monitoring of protected species for all vessels while operating within US EEZ waters. We recommend that BOEM remove the option for lessees to use alternative monitoring methods in place of visual observers until near real-time monitoring technologies for North Atlantic right whales are developed and shown to provide comparable or greater vessel strike risk reduction than a 10-knot speed restriction.	Thank you for your comment. Please refer to response to comment BOEM-2024-0001-0423-0010 regarding MUL-36. Alternative monitoring methods are reviewed through the reduced visibility monitoring plan (MMST-1) when project details are known.
BOEM-2024-0001-0423-0028	[bold: MUL-39] would require the use of standard underwater cables that have electrical shielding to "control the intensity" of EMF. While this is a theoretically useful measure the Draft PEIS determined that the potential impacts would be negligible with or without the	Thank you for your comment. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included separating AMMM measures that have and have not been previously applied; BOEM believes these

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	application of these measures. Therefore this measure should not be required.	are all feasible. In addition, several AMMM measures that are RPs are now identified as such in the PEIS. MUL-39 is an RP in the Final PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are also not part of the Proposed Action.
BOEM-2024-0001-0439-0080	Measure ID: MUL-39 Measure Name: Electrical shielding on underwater cables Description: Lessees should use standard underwater cables that have electrical shielding to control the intensity of electromagnetic fields (EMF). EMF will be further refined as part of the design or cable burial risk assessment. Previously Applied as a COP T&C: Category: ACP Comment: BOEM should change "control the intensity" to "reduce" as shielding does not control the intensity.	Refer to response to comment BOEM-2024-0001-0423-0028. The text in MUL-39 has been revised to address the commenter's concern.
BOEM-2024-0001-0446-0007	1) Identification of Target Species Occasionally the dPEIS uses the term "target species." The term is mostly used in the dPEIS in reference to "changes in target species abundance and distribution" of commercial and recreationally important fish species. See e.g. Vol. I Sec. 3.6.1.3.3 at 3.6.1-46. But it is also used in Appendix G referring mostly to listed species and ESA-listed species of birds and bats. See Vol. II Appendix G BB-3 at G-3-4. The process of identifying and prioritizing "target species" is essential to the sequential and iterative application of the mitigation hierarchy across the full project life-cycle with the goal of achieving No Net Loss (NNL). This is even more important where there are multiple proximate projects planned in an eco-region. In many instances the "target species" identified in the dPEIS will inform developers' commitments to monitor assess cumulative impacts restore regenerate compensate for and offset. For this reason "target species" should refer to a process and criteria that are used to inventory focal species or habitat areas and select and prioritize species and habitat that require AMMM measures. The criteria could include ESA-listed species but also should be broad enough to include non-listed ESA species that are likely to interact with offshore wind projects and which may be impacted or displaced. TNC is not suggesting that all non-listed species and habitats require AMMM measures but the process and criteria used to inventory and select target species should be able to capture effects and interactions with non-listed	Thank you for your comment. The term "target species" was removed from BB-3.

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	species and habitats in order to assess cumulative impacts across lease areas effects on function and productivity and to adaptively manage and mitigate in an ecosystem mindset. Referencing existing standards for habitat and species criteria like those set forth in the International Finance Corporation's Performance Standard 6 may be helpful in identifying target species.	

Table P.5.23-12. Responses to Substantive Comments on Mitigation and Monitoring—Benthic Resources (BEN) and Commercial Fisheries and For-Hire Recreational Fishing (COMFIS)

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BOEM-2024-0001-0352-0008-j	We generally support implementation of the following AMMM measures; however we have concerns with how they are described in Appendix G. BEN-1: Boulder avoidance identification and relocation. As written this AMMM measure provides lessees too much flexibility. For example it allows lessees to deviate from the listed requirements based on considerations about technical and/or economic practicality or feasibility. This AMMM measure would be more useful if it were more prescriptive.	Minor edits have been made to BEN-1 to remove some timeline information. A more detailed measure could be developed in the future as a result of project-specific information and consultations.
BOEM-2024-0001-0439-0037	Measure ID: BEN-1 Measure Name: Boulder avoidance identification and relocation Description: Lessees must avoid boulders within the lease area and along the export cable corridor; if avoidance is not possible Lessees must minimize the boulder relocation distance. If the Lessee needs to relocate boulders they must submit a Boulder Identification and Relocation Plan. The plan must detail to the extent technically and/or economically practical or feasible for the project how the Lessee will relocate boulders as close as practicable to areas immediately adjacent to existing similar habitat. The plan must be submitted to BOEM and BSEE to coordinate with NMFS for a 60-day review 120 days prior to boulder relocation activities. The Lessee must resolve all comments on the Boulder Relocation Plan to BOEM and BSEE's satisfaction prior to implementation of the plan. If BOEM or BSEE do not provide comments on the plan within 60 days of its submittal then the Lessee may presume concurrence with the plan. The plan must include sufficient scope to mitigate boulders for facility installation and operation risks. Previously Applied as a COP	Minor edits have been made to BEN-1 to remove some timeline information. Project-specific NEPA analysis for individual COPs could apply revised, additional, or different AMMM measures as needed.

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	T&C: Check ACP Comment: The last sentence contains a very vague and unclear requirement: "The plan must include sufficient scope to mitigate boulders for facility installation and operation risks." Please provide clarity on what the Plan should contain.	
BOEM-2024-0001-0352-0008-k	BEN-2: Foundation scour protection monitoring. We support this AMMM measure; however it should include further details on what action will be required if issues with scour protection are detected.	BEN-2 has been renamed MUL-41 because it is a technical requirement that does not mitigate impacts on benthic resources. Instead, it includes monitoring scour protection for the integrity of the infrastructure. BOEM has reviewed the suggested AMMM measure modification and determined that any action that may be required would be determined on a case-by-case basis if/when the issue is discovered. Therefore, BOEM has not made any modifications to MUL-41.
BOEM-2024-0001-0447-0005	Further the AMMMS listed in Appendix G regarding commercial fishing mitigation are seriously deficient and the document already violates some of its own premises. Appendix G states that "Project design should be planned in coordination with fisheries" However the PEIS is proposing turbines spaced 0.6x 0.6 nm apart- something commercial fisheries would never propose and object. At 0.6x 0.6 nm spacing if the turbines were uniformly aligned in a grid pattern transiting on a diagonal through the area would put the spacing at close to 0.25 nm. BOEM cannot rely on this AMMM as a true mitigation measure since it is already proposing project layouts that are not supported by the commercial fishing industry. Should BOEM continue to support this spacing it must count all commercial fishing activity as lost in the NY Bight lease areas and adjust analysis accordingly.	The 0.6-by 0.6-nautical-mile spacing was for purposes of analysis in the RPDE for the PEIS and represents the maximum buildout, or maximum number of turbine positions considered in the RPDE. Actual WTG layouts will be determined at the COP-specific NEPA stage and analyzed during project-specific NEPA analysis. Additionally, an NSRA will be submitted with each COP.
BOEM-2024-0001-0452-0005	A. AMMMs Do Not Mitigate Impacts to Fisheries. The draft PEIS identifies twenty AMMM measures that could reduce impacts on commercial fisheries and for-hire recreational fishing. Unfortunately these measures are vague and wholly insufficient to mitigate impacts especially compared to the fisheries impact minimization alternative which is rejected without analysis. Impacts to commercial fisheries in the NY Bight are major but the proposed AMMMs do nothing to reduce the impact level. This leads to the conclusion that there is no difference between Alternative B and Alternative C. The commercial fishing industry has repeatedly requested [Bold: effective] AMMMs including in the NOI for this PEIS	Thank you for your comment. Project-specific NEPA analysis for individual COPs could apply revised, additional, or different AMMM measures as needed. Additional mitigation measures may be implemented at the project-specific level and through consultation with the agencies. Section 2.2 of the Final PEIS describes alternatives considered but not analyzed in detail and the justifications for their dismissal. As stated in PEIS Section 1.3, BOEM's Proposed Action in the Final PEIS is to identify AMMM measures that could avoid, minimize, mitigate, and monitor impacts on resources in the six NY Bight lease areas. At this programmatic stage, the PEIS does not

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	many of which were not included or considered herein. We incorporate those comments in full by reference above and urge BOEM to consider and analyze these measures if it issues a Final PEIS based on this draft. It is disappointing that ”BOEM considered and rejected a "Fisheries Impact Minimization" alternative that would have considered a range of measures that would increase the likelihood that fishing could still occur removed key fishing areas and considered anticipated shifts in fishing grounds. The PEIS should have included this alternative as some impacts of development are still considered "unavoidable" with the proposed AMMMs. While it may not be possible to completely avoid all disruption to harvesting activities disruption is required to be minimized and mitigated as much as possible. Similarly the rejection of the "Pelagic Habitat Impact Minimization" fails to provide the public with an analysis of tailored AMMMs to protect the Mid Atlantic Cold Pool which is a key driver of productivity in the region and for which fishing experts have long requested effective mitigation efforts.	approve any projects and BOEM is not considering project-level details, individual alternatives, or AMMM measures that are project specific.
BOEM-2024-0001-0352-0001	Our key recommendations are as follows. Additional details are provided below. We support the concept of a PEIS for adopting programmatic AMMM measures; however the value of this PEIS as a decision-making tool for determining which AMMM measures to adopt is unclear. The final PEIS should focus on the AMMM measures that are not already very likely to be required by regulation or guidance and are within BOEM's purview. This would make it easier to evaluate the incremental benefits of each AMMM measure on individual impacted resources. It is not possible to comment effectively on AMMM measures related to the final guidance on fisheries mitigation as this document has not been released. BOEM should accept additional comments on these AMMM measures and their impacts once the final guidance is published. We support several of the proposed AMMM measures although we are concerned that some afford too much flexibility in how they are implemented. We suggest additional AMMM measures related to coordination between developers on site assessment and fisheries surveys. We offer several specific comments on the impacts analysis including areas where impacts to fish and fisheries may be underestimated.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.

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BOEM-2024-0001-0352-0009	Additional AMMM measures. We recommend that the following additional programmatic AMMM measures be analyzed in the final PEIS and adopted for all six New York Bight leases. All these recommendations are consistent with past recommendations provided by the Councils. BOEM should require consistency and coordination between new and existing lessees on site assessment and characterization survey methods including fisheries surveys considering the [Underline: recommendations of the Responsible Offshore Science Alliance for fisheries assessment and NOAA Fisheries habitat mapping recommendations for seabed characterization.] Site assessment and characterization survey activities should be carried out as early as possible to inform potential locations for all types of project infrastructure. Information from these surveys should be available to inform the development of alternatives for public comment. Survey locations including for geophysical surveys should not be so narrowly prioritized or limited that flexibility in the precise final locations of project infrastructure is precluded. Clear and coordinated communication should be required for all pre-construction construction and post-construction activities including surveys. This should include the specific locations times vessels gear types contact information and procedures for filing claims for compensatory mitigation.	Thank you for your comment. BOEM provides guidance documents to lessees to inform their fisheries surveys for site assessment. The Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf, which contain recommended survey protocols, can be accessed here: https://www.boem.gov/sites/default/files/documents/about-boem/Fishery-Survey-Guidelines.pdf. These guidelines also reference and encourage lessees to follow ROSA's Offshore Wind Project Monitoring Framework and Guidelines (https://www.rosascience.org/offshore-wind-and-fisheries-resources/). Additionally, BOEM and NMFS are collaborating on an EFH consultation template, which includes a reference to NOAA Fisheries Habitat Mapping Recommendations (https://media.fisheries.noaa.gov/2021-03/March292021_NMFS_Habitat_Mapping_Recommendations.pdf?null). In response to comments received on the Draft PEIS, MUL-26, Coordination for regional monitoring and surveys, was updated to encourage lessees to coordinate survey and monitoring efforts, develop monitoring and survey plans that meet regional data requirements and standards, and make results from monitoring publicly available. In addition, survey data are made available to agencies for consultation purposes and communication of project activities is covered under the Fisheries Communication Plan.
BOEM-2024-0001-0439-0041	Measure ID: COMFIS-1 Measure Name: Compensation for gear loss and damage Description: The Lessee should implement a gear loss and damage compensation program. The Lessee should consult BOEM's draft guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 or as modified in response to public comment in the development of the program. For example the Lessee should consider compensation for damaged gear resulting from interactions between the fishing industry and non-marked/non-charted or marked/charted property (e.g. concrete mattresses) of the Lessee. ACP Comment: Language should include reasonableness of claims.	Thank you for your comment. Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. COMFIS-1 was

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	Developers are responsible for following federal mandates to mark installed structures as directed by the USCG. Lessees can request that NOAA place facilities and obstructions on NOAA charts but lessees do not and cannot control what NOAA includes on its charts. It is the responsibility of mariners to maintain awareness of that information just as they must pay attention to all mariners rules of the road.	combined into COMFIS-6, Fisheries compensatory mitigation, and has been previously applied as a T&C.
BOEM-2024-0001-0423-0013	Commercial & Recreational Fisheries Ocean Winds recognizes the need to reduce potential for loss and provide compensation for fishing gear damaged by interactions with survey and construction operations. Cable protection should be designed to minimize potential for snagging and constructed facilities will be marked/charted so fisheries can avoid these facilities while navigating. It appears that [bold: COMFIS-1] however would have leaseholders compensate fisheries for damage to gear resulting from interaction with marked/charted fixed infrastructure which is not required of any other industry. Rather than avoiding marked/charted facilities this measure could have the effect of encouraging fisheries to deploy gear around known hazards. Leaseholders should properly compensate fisheries for economic losses relating to the buildout of the lease areas but Ocean Winds opposes compensation for gear lost to known hazards that will be charted.	Thank you for your comment. BOEM will take this into consideration in the updated Fisheries Compensatory Mitigation guidance. The guidance is being addressed in a process that is separate from the PEIS.
BOEM-2024-0001-0352-0005	COMFIS-1 and COMFIS-6 refer to BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf. It is our understanding that the final guidance has been internally approved by BOEM and will be released later this year. The public has not yet been notified of the ways in which the final guidance will differ from the draft. We recommend that BOEM release the final guidance as soon as possible. We also recommend that BOEM continue to solicit comments on these AMMM measures and related impacts analysis following publication of the final guidance. The final PEIS should incorporate the final mitigation guidance.	Thank you for your comment. BOEM is actively working on finalizing the Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf. The guidance is being addressed in a process that is separate from the PEIS.
BOEM-2024-0001-0439-0042	Measure ID: COMFIS-2 Measure Name: Scour and cable protection Description: In areas where scour and/or cable protection measures are required the Lessee must ensure that all materials used for these	Thank you for your comment; economic and technical feasibility is already considered at the project-specific COP NEPA review phase.

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	measures reflect the pre-existing conditions at the site as technically or economically feasible. To avoid new hangs for mobile fishing gear in areas that are regularly trawled cable protection measures must have tapered or sloped edges. In areas that are not regularly trawled natural or engineered stone or concrete may be employed. These materials should provide three-dimensional complexity in height and in interstitial spaces as technically or economically feasible. All materials should not inhibit epibenthic growth. The Lessee must prepare a Scour and Cable Protection Plan (SCPP) that includes descriptions and specifications for all cable protection materials. The Lessee must submit the SCPP to BOEM BSEE and NOAA. The Lessee must resolve all comments on the SCPP to BOEM and BSEE's satisfaction before placement of cable protection measures. Previously Applied as a COP T&C: Check Category: T/EACP Comment: Concrete mattresses and rock size that may be needed for scour or cable protection will not "reflect the pre-existing conditions at the site". BOEM should not restrict the use of rock or concrete mattresses. Fourth sentence is unclear what "these" refers to. Cable protection for crossings with other cables and infrastructure may need to be undertaken in a way that is different from these requirements. This condition is too prescriptive flexibility should be built in due to availability of materials and availability of vessels that can install those materials.	
BOEM-2024-0001-0423-0018	[bold: COMFIS-3] would require leaseholders to create and implement a scallop monitoring plan. The Responsible Offshore Science Alliance (ROSA) is currently working on updating their offshore wind project monitoring framework and guidelines to include a regional/multi-developer approach. Ocean Winds believes that creation and implementation of a scallop monitoring plan would be better suited to a regional approach like ROSA is taking or one by an established independent marine institute such as Woods Hole Gulf of Maine Research Institute or similar. The Virginia Institute of Marine Science and the Coonamessett Farm Foundation are also deeply involved in scallop monitoring. Further it is the purview and responsibility of the National Marine Fisheries Service (NOAA Fisheries) to effectively manage the nation's fish stocks. Lessees can assist NOAA Fisheries to the extent NOAA-Fisheries' historic survey	Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include the development and implementation of a Fisheries and Benthic Monitoring Plan. Additionally, MUL-26, Coordination for regional monitoring and surveys, was revised. This RP now encourages coordination for regional monitoring and surveys, development of monitoring and survey plans that meet regional data requirements and standards, and making monitoring results publicly available.

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	efforts are impacted by offshore wind structures to monitor how the marine environment may change as a result of wind development. Similarly although other BOEM-approved projects have required and implemented fisheries monitoring plans BOEM should consider shifting to a regional monitoring approach that can be more easily coordinated and performed by an appropriate independent expert entity. Leaseholders can contribute to the costs of such monitoring but the continued piecemeal approach to fisheries resource monitoring is excessively burdensome to leaseholders and will likely be of less value than the federal government working directly with respected research institutions.	
BOEM-2024-0001-0352-0008-I	COMFIS-3: Scallop monitoring plan We support this AMMM measure; however we are concerned with the implication that lessees will decide if their monitoring results show impacts that differ from expectations and new mitigation and/or monitoring measures are needed. We recommend that BOEM and NMFS work together to review the monitoring results and make this determination.	Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan, which still includes scallops. At the COP stage, the agency communication plan will cover coordination between BOEM and NMFS to review monitoring results and make any necessary determinations. All monitoring plans will be shared, by BOEM, with the other relevant agencies.
BOEM-2024-0001-0439-0043	Measure ID: COMFIS-3 Measure Name: Scallop Monitoring Plan Description: The Lessee should coordinate with NMFS and potentially impacted scallop fishermen to develop a Scallop Monitoring Plan. The plan should discuss potential impacts from construction including turbidity problems due to scour protection cooling of waters changed currents etc. and methods to avoid or reduce those impacts. Lessees should monitor potential impacts on scallop populations and use consistent methodologies for standard and robust data collection. Data should be compatible with other collected information for regional data integration and analyses. If the monitoring results deviate substantially from the anticipated impacts the Lessees are encouraged to propose new mitigation measures and/or monitoring methods to BOEM and BSEE for review and concurrence. ACP Comment: A number of scallop monitoring programs are currently in place. BOEM should address the need for additional monitoring. Current regional data collection efforts are not standardized so it is unclear how lessees can comply with this measure. Clarification should be provided on what standard for data collection should be used. Further there are no guidelines on what	Thank you for your comment. Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan. This plan includes fisheries and benthic resources generally. Adaptive management in COMFIS-3 will be considered on a case-by-case basis and clarification on standards for data collection will be provided in the plan itself. BOEM will work with the lessee and NOAA Fisheries on this component at the COP stage.

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	constitutes a substantial deviation from anticipated impacts. In addition all impacts on scallops should be put into the context of warming waters and effects from climate change.	
BOEM-2024-0001-0446-0009-a	For example COMFIS-3 Scallop Monitoring Plan states that if the monitoring results deviate substantially from the anticipated impacts lessees are encouraged to propose new mitigation measures and/or monitoring methods to BOEM and BSEE for review and concurrence. Lessees should be required to propose new mitigation if results substantially deviate from anticipated impacts. This is adaptive management and it should apply across the board to all AMMM measures. See COMFIS-5.	Thank you for your comment. Based on comments received on the Draft PEIS, COMFIS-3 has been revised. The revised AMMM measure requires that lessees submit a Fisheries and Benthic Monitoring Plan for monitoring impacts of project activities on fisheries and benthic resources. Adaptive management as a result of COMFIS-3 monitoring may be considered on a case-by-case basis. BOEM retains the authority to review a COP and require a revision if circumstances change.
BOEM-2024-0001-0452-0010	F. Exclusion of Mitigation Measures Complementary to Monitoring Measures. We support the two AMMMs dedicated to monitoring fisheries impacts COMFIS-3 and COMFIS-5 and strongly encourage BOEM to require developers to use survey methodology developed by NMFS and industry partners to inform these monitoring plans. Regrettably there is no clear recourse for next steps if and when monitoring shows adverse and unavoidable impacts to benthic and pelagic habitats and regional fisheries. For example COMFIS-3 is directed at scallop monitoring but there are no clear terms on actions to take if the resource is irreversibly damaged. What actions will BOEM take if monitoring plans show fisheries are unable to remain sustainable amid years of habitat-disruptive construction and with introduction of thousands of turbines changing pelagic and benthic conditions? The absence of a regulatory pathway to halting construction or removing turbines before the thirty year lifetime of a project creates significant uncertainty over the effectiveness of mitigation measures that are adopted before impact factors on fishery stocks are well understood.	Based on comments received on the Draft PEIS, COMFIS-3 has been broadened to include a Fisheries and Benthic Monitoring Plan, which includes scallop. BOEM is working with partners, NOAA Fisheries in particular, to make appropriate responses to potential negative impacts on resources. As indicated in COMFIS-3, If the monitoring results deviate substantially from the anticipated impacts, the lessee is encouraged to propose new mitigation measures or monitoring methods to BOEM and BSEE for review and concurrence.
BOEM-2024-0001-0347-0004-e	Specific AMMMs ASGA Supports: COMFIS-4: ASGA supports this AMMM and has frequently advocated for the use of nature-inclusive designs for OSW construction. In addition navigational safety has been a consistent concern among fishermen; ensuring consistent safe access to and through a lease area and providing technology enhancement programs will allow fishermen to adapt.	Thank you for your comment.

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BOEM-2024-0001-0352-0008-m	COMFIS-4: Fisheries mitigation We generally support this AMMM measure; however it requires several revisions. It contains a long list of potential requirements. It is not clear if BOEM may choose to implement only some components or if everything is intended to be implemented together. It may be beneficial to split this into multiple separate AMMM measures to allow for consideration of the various components separately. We are also concerned that a minimum cable burial depth of three feet below stable seabed "where technically feasible" is too shallow to minimize impacts to mobile bottom tending gear fisheries and provides lessees with too much flexibility.	COMFIS-4 came directly from the draft fisheries mitigation guidance (found here: https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf). BOEM's ultimate recommendations will follow the Final Fisheries Mitigation Guidance. COMFIS-4 has been classified as an RP. Project-specific mitigation measures to reduce impacts will be considered at the project stage.
BOEM-2024-0001-0383-0010	Additionally AMMM COMFIS-4 of Appendix G identifies artificial reefs as sensitive benthic features important to commercial fisheries as "areas of commercial fishery production." [Footnote 27: See Appendix G at https://www.boem.gov/sites/default/files/documents/renewable-energy/NY%20Bight_DraftPEIS_AppG_Mitigation%20and%20Monitoring_508.pdf p. G-7.] This is also incorrect- commercial fisheries even certain fixed gear fisheries are prohibited from fishing on artificial reefs either due to the nature of their gear (mobile bottom tending fisheries) or regulations exist that establish artificial reefs for recreational use areas only and prohibit commercial use (fixed gear). [Footnote 28: See for example NOAA's prohibition on fixed gear in artificial reef areas off the New Jersey coast: https://www.federalregister.gov/documents/2018/07/09/2018-14661/fisheries-of-the-northeastern-united- states-special-management-zones-for-13-new-jersey-artificial and https://www.fisheries.noaa.gov/action/special- management-zones-13-new-jersey-artificial-reefs.] BOEM's assumption that artificial reefs are areas of "commercial fishery production" is false. BOEM must stop living in a world of its own making and honestly identify impacts and facts for what they are not what BOEM would like them to be.	Thank you for your comment. BOEM, in consultation with NMFS, strives to minimize and mitigate potential negative impacts of offshore wind infrastructure on fisheries and habitats.
BOEM-2024-0001-0383-0011	The Appendix G COMFIS-4 AMMM also falls short of the OSCLA mandate to "ensure safety" when it comes to offshore wind development. The AMMM simply requires "Considering Lessee-	Thank you for your comment. BOEM will continue to work with lessees and potential regional compensatory funds to support updating units. The draft fisheries mitigation guidance (found

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	funded radar system upgrades for commercial and for-hire recreational fishing vessels (e.g. solid state Doppler-based marine vessel radar systems" and then quotes the 2022 National Academies of Sciences which study confirmed years of data we had previously submitted to BOEM and BOEM ignored. Perhaps BOEM did not read the study. If it had it would know that the study found that no current solutions to marine vessel radar interference because of offshore wind turbines exist. The National Academies of Sciences report concluded that "WTGs reduce the effectiveness of both magnetron-based and Doppler-based (or pulse) MVR radar" [Footnote 29: Wind Turbine Generator Impacts to Marine Vessel Radar (2022) National Academies Press available at https://nap.nationalacademies.org/catalog/26430/wind-turbine-generator-impacts-to-marine-vessel-radar p. 5.] and that the USCG recognizes that "how MVR will lose efficacy in a WTG environment and corresponding impact on navigation performance requires in-depth testing and evaluation". [Footnote 30: Ibid p. 66.] Therefore providing fishermen with a fund to purchase new radars that will themselves experience interference is not an effective mitigation measure. It is not a solution. Solutions will require "in depth testing and evaluation" that has not yet occurred. The NAS study was careful to point out that "It is noteworthy that there are no published studies of WTG interference on Doppler-based solid-state radar used for marine navigation Therefore assertions of the suitability of solid-state radar or lack thereof for operation in a WTG environment are inconclusive from these experiments." [Footnote 31: Wind Turbine Generator Impacts to Marine Vessel Radar (2022) National Academies Press available at https://nap.nationalacademies.org/catalog/26430/wind-turbine-generator-impacts-to-marine-vessel-radar p. 5]. Therefore BOEM cannot assert that solid-state radar is a solution to the very real impact of marine radar interference caused by its proposed action. This does not count as a mitigation measure.	here: https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf) also includes radar system upgrades for commercial and for-hire recreational fishing vessels.
BOEM-2024-0001-0423-0005	[bold: COMFIS-4] directs lessees to design their projects in coordination with fisheries including locating turbines to avoid areas of commercial fishery production. Developers bid on lease areas based on estimates of the expected income versus expected	BOEM continues to work with developers and NOAA Fisheries for micrositing and the development of COP NEPA alternatives that may consider removing WTG positions. This will occur at the project-specific stage and is, therefore, out of the scope of the

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	expenses to permit construct maintain and decommission a wind project with an eye towards optimizing clean energy production while delivering value to the electricity customers who will be the ultimate purchasers of the power from the project. The loss of turbine positions creates a suboptimal lease area with a reduced generation yield and a significant impact to the cost per megawatt and a corresponding decrease in clean energy production and its associated benefits to the climate and environment while unfortunately increasing ratepayer cost. Any decision concerning the utilization of wind turbine positions must be left to the developer who must balance costs (including potentially the cost of mitigating fisheries impacts identified as needed during project review) and impacts to the project cost. Additionally this measure proposes using cable installation techniques that would remove potential obstructions from areas where bottom-tending fishing gear is actively used or consolidating such obstructions in areas where bottom- tending fishing gear is not actively used. This would appear to be in conflict with the directive in BEN-1 [italicized: "if avoidance is not possible Lessees must minimize the boulder relocation distance."] Lastly it is important to recognize that as a practical matter it is often difficult to know where areas of commercial fishery production are located given the competitive pressures on fishing operators that press them to keep such information to themselves. This can make efforts to avoid such impacts into an exercise in speculation and can empower fishing interests to undermine offshore wind development (and resulting societal benefits in the form of emissions reductions and increased electricity reliability) by reporting fishing activity in particular locations.	PEIS. At the project-specific level, consultations are done with NMFS and USFWS and the lessee is not the sole decisionmaker on turbine locations. BOEM has classified COMFIS-4 as an RP. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.
BOEM-2024-0001-0439-0044	Measure ID: COMFIS-4 Measure Name: Fisheries mitigation Description: Static cable design elements are recommended: All static cables should be buried to a minimum depth of 3 feet below stable seabed where technically feasible. Technical feasibility constraints include seabed conditions that preclude burial such as telecommunication cable crossings. Deeper cable burial depths may be required dependent on risks identified in cable route design (see the Carbon Trust's Cable Burial Risk Assessment Methodology at: https://ctprodstorageaccountp.blob.core.windows.net/prod-drupal-	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM

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	files/documents/resource/public/cable-burial-risk-assessment-guidance.pdf).Lessees should avoid installation techniques that raise the profile of the seabed such as the ejection of large previously buried rocks or boulders onto the surface. The ejection of this material may damage fishing gear. If raising the profile of the seabed is unavoidable the Lessees should propose measures in the COP to minimize the total area of impact through measures such as removing potential obstructions from areas where bottom-tending fishing gear is actively used or consolidating such obstructions in areas where bottom-tending fishing gear is not actively used. If needed cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure ensures that seafloor cable protection does not introduce new obstructions for mobile fishing gear. Thus the cable protection measures should be trawl-friendly with tapered or sloped edges. If cable protection is necessary in "non-trawlable" habitat such as rocky habitat then the Lessees should use materials that mirror the benthic environment. Where technically and economically feasible cables should share corridors and minimize the total area disturbed. Project design should be planned in coordination with fisheries:1. The facility design should seek to maximize existing access to fisheries in balance with other siting constraints by considering: Transit within the project area and traditional fishing activities within the project area. Consolidation of infrastructure where practicable to reduce space-use conflicts. Technologies to reduce total project area and meet energy production commitments. Turbine locations should be sited to avoid areas of commercial fishery production such as known sensitive benthic features and natural and artificial reefs. Facility planning should use nature-inclusive designs (see Evaluating the Effectiveness of Nature Inclusive Design Materials at: https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP_2022-2023.pdf) where applicable to maximize available habitat for fish. Installation techniques and time windows should minimize disruption to fishing activities (e.g. simultaneous lay and burial or conducting activity during the appropriate time of year).To improve safety at sea in and around offshore wind facilities BOEM recommends that Lessees consider the	measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. BOEM has classified COMFIS-4 as an RP.

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	following measures in their plan submittals:2. Charting all facilities and obstructions resulting from construction and operations of an offshore wind energy facility and providing that information to NOAA USCG and navigational software companies. Employing liaisons with experience in the commercial fishing industry to provide safety and communication services during construction. Monitoring cable burial in real-time and reporting all potential hazard events to USCG as soon as possible throughout the life of the project. Using digital information technology platforms (e.g. smartphone applications) to bring together survey and construction schedules and locations in addition to standard local notices to mariners via the USCG. Marking facilities and appurtenances with permanent identification of the project and company. Providing training opportunities for the commercial fishing industry to simulate safe navigation through a wind facility in various weather conditions and at various speeds. Monitoring safety threats (e.g. radar disruption ice shedding vessel allisions and collisions security threats unexploded ordnance/munitions of explosive concern and impacts on search and rescue efforts) throughout the life of a project. Consulting with the fishing industry and USCG to identify which structures would be most appropriate for Automatic Identification System (AIS) transponders consistent with BOEM's Lighting and Marking Guidelines (https://www.boem.gov/2021-lighting-and-marking-guidelines).Considering Lessee-funded radar system upgrades for commercial and for-hire recreational fishing vessels (e.g. solid state Doppler-based marine vessel radar systems; see National Academies of Science Engineering and Medicine 2022).[Footnote 7: National Academies of Science Engineering and Medicine. 2022. Wind Turbine Generator Impacts to Marine Vessel Radar. Washington D.C.: The National Academies Press. https://doi.org/10.17226/26430.Category: V G DACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. This measure also constitutes new COP guidance. If BOEM wishes to implement such a measure it should be proposed for inclusion in guidance and go through the guidance development process. This process should include outreach to industry and public review and comment. Static design measures: Measure 2: The measure to avoid	

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	installation techniques that raise the profile of the seabed may be impractical as the ability to move all possible ejected rocks may not be feasible. Recommended narrowly tailoring this based on risked based approach that focuses on the size of boulder the use of the area and how these factors combine to create a risk profile. Measure 3: Concrete mattresses or rock is needed for cable protection and will not resemble the pre-existing environment. Measure 4: Shared corridors are being developed by NYS and NJ for future projects. For current projects corridors were developed with proprietary information and OREC awards were made based on specific landfall locations and POIs. Project design measures: Measures for reducing project area needed for windfarm or consolidating cables do not consider economic and technical viability. In addition these measures are duplicative of the alternatives development process in which the technical and economic feasibility of alternatives are measured using the criteria established in the "Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operations Plans pursuant to the National Environmental Policy Act". This measure serves to circumvent the process established to identify alternatives and creates a separate process without a public process. BOEM should remove these measures and should instead rely on its established processes for alternatives identification and environmental review. If BOEM wishes to create new guidance for COP development it would need to go through a public process to revise current COP guidance. Safety measures: Lessees can request that NOAA place facilities and obstructions on NOAA charts but lessees do not and cannot control what NOAA includes on its charts.	
BOEM-2024-0001-0452-0011	G. Safety RODA and our members have repeatedly raised concerns regarding the ability of vessels to safely navigate through and around leased areas. COMFIS-4 includes consideration of funding radar system upgrades for fishing vessels citing the 2022 National Academies of Sciences (NAS) report. [Footnote 16: Draft PEIS Appendix G p. G-7.] However in contradiction to the draft PEIS's conclusions the NAS report found no solutions to marine vessel radar interference from offshore wind turbines currently exist and additional studies need to occur. [Footnote 17: Wind Turbine	Thank you for your comment. COMFIS-4 came directly from the draft fisheries mitigation guidance (found here: https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf). BOEM's ultimate recommendations will follow the Final Fisheries Mitigation Guidance. BOEM has classified COMFIS-4 as an RP. BOEM encourages lessees to analyze and consider

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	Generator Impacts to Marine Vessel Radar (2022) National Academies Press available at https://nap.nationalacademies.org/catalog/26430/wind-turbine-generator-impacts-to-marine-vessel-radar p. 5.] It is therefore premature for BOEM to assert that solid-state radar is a solution to marine radar interference and include it as a AMMM	implementing these RPs, as they may further avoid and minimize impacts.
BOEM-2024-0001-0452-0009	E. Minimum Cable Burial Depth is Insufficient For years the commercial fishing industry and others have informed BOEM about the dynamic nature of soft bottom areas in the Mid-Atlantic and Southern New England regions. COMFIS-4 maintains a minimum depth of cable burial of three feet which is insufficient in high-energy areas where ocean sediment moves. It is paramount that bottom tending gear will not be threatened by potentially exposed cables which would pose risk for operator and developer alike. Greater burial depths are also known to reduce impacts to stocks vulnerable to heat and EMF effects from cables. Therefore we maintain previous requests for a [Bold: minimum of six feet for cable burial depth] across all projects with site-specific analyses to inform where greater depths are merited.	COMFIS-4 is an RP and burial is recommended at 3 feet below stable seabed as the minimum. Actual depths will be determined at the project-specific phase. Export cable burial depth of 3 to 19.6 feet (0.9 to 6 meters) is the anticipated potential range of burial depth; 6 feet (1.8 meters) is typical target burial depth. Depths may vary based on site-specific factors (e.g., soil type, cable/pipeline crossings, crossing of navigation channels or other federal civil work projects, other federal or state requirements). BOEM has adopted a procedural risk assessment approach to establishing minimum cable burial depth, where lessees provide analyses on site-specific risks along cable routes and establish cable burial depths accordingly. Risks are varied along cable routes and cable burial depths should reflect these changes in risk. Accordingly, BOEM has adopted the Carbon Trust's Cable Burial Risk Assessment Methodology. A BOEM-funded study identified a typical burial depth between 3 and 6 feet, dependent on site-specific conditions (Sharples 2011). This study supports a minimum cable burial depth of 3 feet; however, the minimum burial depth was based on an assumed heat dissipation at the seafloor, unrelated to fishing activity. Carbon Trust's Cable Burial Risk Assessment Methodology notes a maximum penetration depth of 0.3 meter for fishing activity, including trawling. With a safety factor of 2, a 2-foot minimum cable burial depth is supported in areas with fishing activity.
BOEM-2024-0001-0346-0007	4. The Draft PEIS Unreasonably Rejected Developing Sets of Alternatives That Would Protect Fisheries and Fishing Grounds In its PEIS scoping comments FSF explained that BOEM's Fisheries Mitigation Guidelines drafted and released back in late 2021 established a series of steps that could be taken to mitigate the impacts of offshore wind development on fishing activity. FSF urged	Thank you for your comment. COMFIS-4, Fisheries mitigation, came directly from the draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585 (https://www.boem.gov/sites/default/files/documents/renewable-

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	BOEM to include these proposed mitigation measures as AMMMs in the PEIS. FSF explained: In particular the AMMMs should focus on adopting a coherent set of standards that integrate with each element of the Fisheries Mitigation Guidelines. For instance subpart B Project Siting Design Navigation and Access identifies a series of "[r]ecommended facility design elements" that "should maximize access to fisheries." Draft Guidelines at Especially for the four contiguous lease areas in the New York Bight each of these facility design elements apply with equal force to these four lease areas collectively as they would for an individual lease area standing alone. For instance transit should be coordinated within these project areas (not just within a single project area). Likewise infrastructure within these project areas should be laid out to reduce overall space-use conflicts. As the Fisheries Mitigation Guidelines explain "Coordination of turbine and substation array layouts between and among neighboring lease areas to allow safe fishing and transit through multiple projects" should be pursued. Draft Guidelines at 6. If there are areas on the borders of project areas where fishing activity is less intense it would make sense to group supporting infrastructure such as substations in that border area. Sensitive benthic features or valuable fishing grounds may straddle project areas and so "[f]acility planning should use nature inclusive designs where applicable to maximize available habitat for fish." Draft Guidelines at 6. As an example of valuable fishing grounds straddling project areas the figures set forth above show that the northeastern quadrant of Community Offshore Wind lease and the entirety of the adjacent Attentive Energy lease overlap with levels of high scallop fishing activity. However after much fanfare in releasing and seeking comment on these Mitigation Guidelines in mid to late 2021 BOEM has done nothing further with them for over two years since the comment period closed on January 7 2022.	energy/DRAFT%20Fisheries%20Mitigation%20Guidance%200623 2022_0.pdf). BOEM's ultimate recommendations will follow the Final Fisheries Mitigation Guidance once completed.
BOEM-2024-0001-0346-0006	Further the COMFIS-4 AMMM requires a minimum cable burial depth of three feet. (3.6.1-53) However other BOEM documents have required six feet minimum cable burial depth. The fishing industry has repeatedly explained that given how the soft ocean bottom moves six feet should be an absolute minimum burial depth. Even the Draft PEIS discusses how cables buried only three feet deep	COMFIS-4 is an RP and burial is recommended at 3 feet below stable seabed as the minimum. Actual depths will be determined at the project-specific phase. Generally, export cable burial depth of 3 to 19.6 feet (0.9 to 6 meters) is the anticipated potential range of burial depth; 6 feet (1.8 meters) is the typical target burial depth. Depths may vary

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	are quite likely to become unburied. (3.6.1-45) The Draft PEIS explained that wind farm development will have other adverse and unavoidable impacts on the New York Bight pelagic and benthic habitat identifying in particular "[s]uspension and re-settling of sediments due to seafloor disturbance habitat quality impacts including reduction in certain habitat types as a result of seafloor disturbance [and] conversion of soft-bottom habitat to new hard-bottom habitat." (4.1-2) Indeed even though hundreds of millions of dollars of ex vessel revenue is at stake there is but one Draft PEIS AMMM directed to scallops and that is for monitoring. Monitoring is important but it will likely be more in the realm of conducting an autopsy on the Mid-Atlantic scallop resource rather than trying to do something to save it. If and when monitoring reveals the projected negative impacts are actually happening it's not like BOEM can or will do anything about it. Wind turbines aren't going to be removed for thirty years once they are installed.[Footnote 2: The PEIS can't even bring itself to admit that impacts from wind farms on fisheries are irretrievable apparently because in 30 years the windfarms are set to be decommissioned. (4.2-3) BOEM seems to think that fish and fisheries can sprout again like a phoenix. However in thirty years these fishing businesses will be long since gone and the shore- side infrastructure the lucrative scallop fishery supports will give way to other uses of highly-valuable shorefront real estate and infrastructure.]	based on site-specific factors (e.g., soil type, cable/pipeline crossings, crossing of navigation channels or other federal civil work projects, other federal or state requirements). BOEM has adopted a procedural risk assessment approach to establishing minimum cable burial depth, where lessees provide analyses on site-specific risks along cable routes and establish cable burial depths accordingly. Risks are varied along cable routes and cable burial depths should reflect these changes in risk. Accordingly, BOEM has adopted the Carbon Trust's Cable Burial Risk Assessment Methodology. A BOEM-funded study identified a typical burial depth between 3 and 6 feet, dependent on site-specific conditions (Sharples 2011). This study supports a minimum cable burial depth of 3 feet; however, the minimum burial depth was based on an assumed heat dissipation at the seafloor, unrelated to fishing activity. Carbon Trust's Cable Burial Risk Assessment Methodology notes a maximum penetration depth of 0.3 meter for fishing activity, including trawling. With a safety factor of 2, a 2-foot minimum cable burial depth is supported in areas with fishing activity. Adaptive management as a result of COMFIS-3, Fisheries and Benthic Monitoring Plan, will be assessed on a project-by-project basis. At the COP stage, the agency communication plan will cover coordination between BOEM and NMFS to review monitoring results and make any necessary determinations. All monitoring plans will be shared, by BOEM, with the other relevant agencies.
BOEM-2024-0001-0383-0009	8. AMMMS: The AMMMS listed in Appendix G regarding commercial fishing mitigation are seriously deficient and the document already violates some of its own premises. Measure ID COMFIS-4 of Appendix G states that "Project design should be planned in coordination with fisheries". [Footnote 24: See Appendix G at https://www.boem.gov/sites/default/files/documents/renewable-energy/NY%20Bight_DraftPEIS_AppG_Mitigation%20and%20Monitoring_508.pdf p. G-6.] However the PEIS is proposing turbines spaced 0.6x 0.6 nm apart- something commercial fisheries would never propose. At 0.6x 0.6 nm spacing if the turbines were uniformly aligned in a grid pattern transiting on a diagonal through the area	Thank you for your comment. The 0.6- by 0.6-nautical-mile spacing was for purposes of analysis in the RPDE for the PEIS and represents the maximum buildout, or maximum number of turbine positions considered in the RPDE. Actual layouts will be determined on a project-specific basis and will be analyzed through the COP-specific NEPA review. Relative to the reef effect, BOEM, in consultation with NMFS, strives to minimize and mitigate potential negative impacts of offshore wind infrastructure on fisheries and habitat. Regarding vessel traffic, the Final PEIS text has been updated to remove reference to commercial traffic that will be farther

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	would put the spacing at close to 0.25 nm! BOEM cannot rely on this AMMM as a true mitigation measure since it is already proposing project layouts that are not supported by the commercial fishing industry. Should BOEM continue to support this spacing it must count all commercial fishing activity as lost in the NY Bight lease areas and adjust analysis accordingly. BOEM also continues to assume that turbine structures creating artificial "reef effect" will be "beneficial" for commercial fishing. For example the PEIS states that the turbines "could create an artificial reef effect that attracts species of interest for commercial fishing resulting in commercial traffic father offshore than typically occurs." [Footnote 25: See PEIS at https://www.boem.gov/sites/default/files/documents/renewable-energy/_NY%20Bight_DraftPEIS_Vol1_Chapters1-4_January2024_508.pdf p. 3.6.7-18.] First of all commercial fishing already exists in the area. Commercial fishing traffic already occurs that far offshore. All the time. BOEM misrepresents accurate commercial fishing activity with this statement. Secondly artificial reefs create exclusion zones for mobile bottom tending gear fisheries. Mobile bottom tending gear can hang up on existing reefs- whether natural or artificial- and cause gear loss/damage as well as safety situations. Therefore existing artificial and natural reefs are already exclusion zones for mobile bottom tending gear fisheries. The same will be true for all "reef effects" created by the turbines. Therefore by identifying a "reef effect" BOEM has already identified that its action is creating exclusion zones for mobile bottom tending gear vessels. We therefore request that BOEM specifically identify this as a major adverse impact specifically on mobile bottom tending fisheries. BOEM must differentiate between fisheries gear types as not all commercial fisheries are the same. By conflating all commercial fisheries into one category impacts are masked. In fact the above quote from the PEIS in its full format masks impacts by conflating impacts between commercial and recreational fisheries- these impacts are not the same. [Footnote 26: Ibid. "The installation of WTGs within the geographic analysis area could create an artificial reef effect that attracts species of interest for commercial or recreational fishing and sightseeing resulting in recreational and commercial vessel traffic farther offshore than typically occurs."]	offshore. The use of the word *commercial* was not intended to refer to commercial fishing vessels, but rather commercial sightseeing or other commercial activity vessels.

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	BOEM cannot include both in the same sentence as if the impacts will be the same; they will not. By combining recreational fisheries (which may desire artificial reefs for targeting certain species) and commercial fisheries (some of which will be excluded from a wind farm specifically due to the presence of artificial reefs) in the same analysis and giving blanket impacts statements BOEM masks the true impacts to each distinct user group. This is inappropriate and must stop.	
BOEM-2024-0001-0406-0023	vi. Measures That Should Be Reserved for Guidance Many of the proposed AMMM measures in the Draft PEIS are not true mitigation measures and would be more appropriate to incorporate into BOEM's guidelines. Rather than use the PEIS process as a substitute for guidance BOEM should instead work with offshore wind lessees on a process to inform and amend the appropriate guidance documents. Examples of proposed AMMM measures that fall under this category include all of the measures flagged as vague and unenforceable in section IV.b.ii above as well as the following: COMFIS-4 which appears to be taken verbatim from Sections B and C of BOEM's draft Fisheries Mitigation Guidance. [Footnote 11: DRAFT Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585 (June 2022) available at https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf.] COSW respectfully recommends that rather than including the entirety of the draft Fisheries Mitigation Guidance in the PEIS by splitting it among several AMMM measures it would be more appropriate to finalize that guidance. NAV-2 which would require the wholesale adoption of the U.S. Coast Guard's (USCG) Marine Planning Guidelines (MPGs) "[i]n developing their initial COP or as part of subsequent updated versions." The MPGs are by their own terms guidance intended to be applied on a case-by-case basis. [Footnote 12: See GUIDANCE ON THE COAST GUARD'S ROLES AND RESPONSIBILITIES FOR OFFSHORE RENEWABLE ENERGY INSTALLATIONS (OREI) ON THE OUTER CONTINENTAL SHELF (OCS) NVIC 02-23 (October 2023) Enclosure 4 available at https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/5ps/NV	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. COMFIS-4 has been classified as an RP. Upon finalization of Fisheries Mitigation Guidelines, lessees will be encouraged to follow that guidance.

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	IC/2020/2023/OREI%20NVIC%202023_V2_29NOV2023.pdf] Any application of the MPGs to COP review should likewise be accomplished through BOEM guidance. [Footnote 13: We also note that mandatory application of the MPGs could circumvent notice and comment rulemaking under the APA see Section II.b above and may result in the commercially significant loss of wind turbine positions adjacent to shipping lanes.]	
BOEM-2024-0001-0347-0004-f	COMFIS-5: While ASGA fully supports efforts to mitigate the impacts of OSW on federal fisheries surveys BOEM_must finalize its Draft Guidance and continue working with NOAA Fisheries Science Centers and commercial and recreational fishing industries to develop collaborative effective and adaptive methods to maintain the longstanding time series of these surveys in WEAs.	Thank you for your comment.
BOEM-2024-0001-0439-0045	Measure ID: COMFIS-5Measure Name: Fisheries Survey Guidelines Description: Lessees should follow the BOEM Fisheries Survey Guidelines (Fisheries Guidelines updated March 27 2023 at: https://www.boem.gov/sites/default/files/documents/about-boem/Fishery-Survey-Guidelines.pdf) with regards to pre- during- and post-construction fisheries monitoring survey plan design. Category: VACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs. As Alternative C assumes adoption of all AMMMs as terms and conditions of plan approval for the purposes of the analysis these AMMMs are not in fact voluntary. Adoption of voluntary AMMMs through terms and conditions undermines the very voluntary nature of those measures.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.
BOEM-2024-0001-0469-0019	AMMM measure COMFIS-5 states that lessees should follow BOEM's Fishery Survey Guidelines. [Footnote 71 NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 appx. G at G-7.] These guidelines are intended to aid lessees in performing a survey that is maximally helpful to BOEM in determining the impacts to shellfish and finfish in a lease area. [Footnote 72 BUREAU OF OCEAN ENERGY MGMT. GUIDELINES FOR PROVIDING INFORMATION ON FISHERIES FOR RENEWABLE ENERGY DEVELOPMENT ON THE ATLANTIC OUTER CONTINENTAL SHELF PURSUANT TO 30 CFR PART 585 1-2 (Mar. 27 2023) https://www.boem.gov/sites/default/files/documents/about-	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. COMFIS-5 is an RP and project-

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	boem/Fishery-Survey-Guidelines.pdf] Rather than listing an entity responsible for enforcement of the proposed mitigation measure the Draft PEIS states that it is voluntary. [Footnote 73 NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 appx. G at G-7.] Again COP conditions should not be voluntary; BOEM can and should mandate that lessees follow the guidelines.	specific mitigation measures to reduce impacts will be considered during the COP-specific NEPA review.
BOEM-2024-0001-0423-0017	[bold: COMFIS-6] expands fisheries compensation mitigation to require compensation to shoreside businesses for losses indirectly related to project development. This is extremely troubling as tying businesses losses to the presence of wind turbines (much less specific projects) as opposed to transitory economic or market conditions or other causes would be extremely difficult. Before compensation is required for shoreside businesses a demonstrated loss caused by offshore wind should be shown and conditions should relate first to avoiding minimizing and mitigating measures with financial compensation only where the other measures in the hierarchy have proven insufficient. At best such a fund should be determined and funded through the regional administrative fund along the lines of the proposed Nine-State Regional Fisheries Compensation Fund[Footnote 3: See Nine Atlantic Coast States Scoping Document: Framework for Establishing a Regional Fisheries Compensation Fund Administrator for Potential Impacts to the Fishing Community from Offshore Wind Energy Development Revised April 13 2023. Potential losses to be considered for potential compensation from "up or downstream effects to shoreside fishing businesses" are included in the framework on page 15.] not on a project level. Additionally this AMMM would require that [italicized: "for losses to commercial and for-hire recreational fishermen the Fund must be based on the revenue exposure for fisheries."] Ocean Winds reminds BOEM that many of the studies that consider the impact that offshore wind will have to fisheries rely on the flawed assumption that would assume full exclusion for fishing with the Project Areas. In fact offshore wind projects have been designed to facilitate navigation and fishing activities. A grid layout is [bold: not] optimized for wind production. As such we believe and have been told directly by members of the fishing industry that fishing will	Thank you for your comment. BOEM agrees that compensatory mitigation is last step in the mitigation hierarchy. The project-specific COP NEPA stage will evaluate potential impacts on commercial fisheries and potential site-specific AMMM measures. COMFIS-6, Fisheries compensatory mitigation fund, allows for compensation to shoreside businesses for losses indirectly related to project development. Revenue exposure data compiled by NOAA/NMFS attempt to capture both commercial and party/charter information. In current draft T&Cs, these data are the minimum basis for Direct Compensation Program funding. BOEM anticipates that shoreside service expected exposed revenue be based off a multiplier on the commercial and for-hire recreational fishing revenues to ensure proper funds are available. However, it should be incumbent upon the shoreside business or service to verify its loss. Additional project- and site-specific analysis will be conducted during the COP-specific NEPA review, which may result in revised, additional, or different AMMM measures.

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	occur in the Project Areas. Assumptions to the contrary dramatically overstate the impact that the offshore wind industry will have on fisheries.	
BOEM-2024-0001-0347-0004-g	COMFIS-6: Fisheries Compensatory Mitigation is a complicated yet necessary component to OSW development. While ASGA fully supports projects inclusion of such funds for fishermen we have been frustrated by lack of a centralized and standardized process. We encourage BOEM and developers look to established fisheries compensation programs for lessons learned and continue assisting in the development of a regional/national framework.	Thank you for your comment.
BOEM-2024-0001-0383-0012	The Appendix G COMFIS-6 AMMM leaves the analysis for determining losses to shoreside businesses from the proposed projects to the developer. [Footnote 32: "For losses to shoreside businesses the Lessee will analyze the impacts on shoreside seafood businesses." See Appendix G at https://www.boem.gov/sites/default/files/documents/renewable-energy/NY%20Bight_DraftPEIS_AppG_Mitigation%20and%20Monitoring_508.pdf p. G-7.] This is unacceptable. It is BOEM's responsibility under NEPA to analyze the socioeconomic impacts of actions that it is proposing. The AMMM details that the developer must submit a report of its analysis to BOEM subject to BOEM's approval but this takes the entire analysis process out of the public process and precludes public comment on the document/plan. This is unacceptable. Shoreside businesses such as Seafreeze Shoreside and Seafreeze Ltd. should have the opportunity to see how the analysis of impacts to our vessels is being conducted and the opportunity to comment on such; it should not be a process conducted behind closed doors between BOEM and developers. As part of the federal public process analyzing socioeconomic impacts mandated by NEPA the analysis should be conducted by BOEM and as part of the public NEPA process. Additionally the AMMM specifies that the Lessee may use BOEM's Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries in developing its analysis for shoreside impacts. There are two problems with this: (1) The document is a Draft document which has never addressed the myriad of responses as to its inadequacies; a Draft should not be the authoritative definition of a NEPA mitigation measure and (2) One of the most	Thank you for your comment. COMFIS-6, Fisheries compensatory mitigation fund, also allows for compensation to shoreside businesses for losses indirectly related to project development. Revenue exposure data compiled by NOAA/NMFS attempt to capture both commercial and party/charter information. In current draft T&Cs, these data are the minimum basis for Direct Compensation Program funding. BOEM anticipates that shoreside service expected exposed revenue be based off a multiplier on the commercial and for-hire recreational fishing revenues to ensure proper funds are available. However, it should be incumbent upon the shoreside business or service to verify its loss. Additional project- and site-specific analysis will be conducted during the COP-specific NEPA review, which may result in revised, additional, or different AMMM measures. The lessees are encouraged to use BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585. BOEM anticipates also recommending the guidance once it is finalized, which will help avoid, minimize, and mitigate impacts on fisheries.

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	egregious sections of the Draft was its extremely errant section on shoreside impacts. We have attached our comments on the Draft inclusive of our comments on the uninformed and incorrect Draft assumptions regarding shoreside impacts as well as fishing impacts. The Draft simply cannot be used to estimate shoreside impacts. It is wrong. We reiterate the SBA's Office of Advocacy letter attached regarding BOEM's Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries in which it states that BOEM must conduct a Regulatory Flexibility Act analysis on the impacts to small fishing businesses from its offshore wind development activities. This includes both fishing vessels as well as related shoreside businesses. That cannot be part of a developer analysis; that must be conducted by BOEM itself.	
BOEM-2024-0001-0406-0021-e	COMFIS-6 which would require each developer to establish and implement a fisheries compensatory mitigation fund. This process has historically been managed by state agencies and BOEM has previously stated that it lacks the authority to require contributions to any particular compensation fund. [Footnote 8: Request for Information Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development (November 2021) at 4 available at https://www.boem.gov/sites/default/files/documents/renewable-energy/BOEM-2021-0083-0001.pdf.] Moreover this AMMM measure also disregards the offshore wind industry's voluntary participation in the development of a regional fisheries compensation fund in collaboration with eleven Atlantic coast states and representatives from the fishing industry. [Footnote 9: See https://offshorewindpower.org/fisheries-mitigation-project.] COSW acknowledges that the impacts and mitigation associated with onshore facilities should be analyzed under NEPA as a connected action and thus we support the general discussion of onshore impacts in the Draft PEIS. But as the Draft PEIS acknowledges "the location of landfalls and onshore facilities are unknown." Draft PEIS 2.1.2.11 (p.2-5). Because of this the Draft PEIS "describes the types of impacts from construction and operation of onshore components generally and largely defers the analysis of onshore components to the COP-specific NEPA documents." Id. Therefore consideration of	A new RP (COMFIS-7) was created in response to comments received on the Draft PEIS to encourage lessees' participation in the Fisheries Compensation Fund. BOEM does not preclude the lessees of the NY Bight from using a regional fund administrator, provided BOEM's requirements are met. BOEM recognizes the advantages of a single fund, yet also recognizes that a lessee may prefer to set the terms of a fund for its individual project. Project-specific details, including potential mitigation measures, will be analyzed at the COP-specific NEPA stage because project-specific details are out of scope for the PEIS. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.

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	non-jurisdictional AMMM measures should be deferred to the individual COP phase as well (with "adoption" of such measures being the responsibility of the relevant federal state and local agencies). Moreover BOEM's authority under OCSLA applies only on the OCS so BOEM cannot and should not commit itself to onshore mitigation measures through the PEIS.	
BOEM-2024-0001-0439-0046	Measure ID: COMFIS-6 Measure Name: Fisheries compensatory mitigation Description: The Lessees must establish a compensation/mitigation fund (Fund) to compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity resulting from displacement from fishing grounds due to project construction and operations. The Fund should also allow for compensation to shoreside businesses for losses indirectly related to project development. The Lessee may use BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 (Guidance) to aid it in establishing such a Fund. For losses to commercial and for-hire recreational fishermen the Fund must be based on the revenue exposure for fisheries. For losses to shoreside businesses the Lessee will analyze the impacts on shoreside seafood businesses. Shoreside businesses that may be impacted may include (but are not limited to): fishing gear suppliers and repair services vessel fuel and maintenance services ice and bait suppliers seafood processors and dealers and wholesale seafood distributors. The Lessee will be required to provide BOEM with its analysis (including any model outputs such as an IMPLAN model or other economic report) verifying the impacts on shoreside businesses and services. The Lessee must submit to BOEM a report that includes (1) a description of the structure of the Fund and (2) an analysis of the impacts of the expected development on shoreside businesses for a 45-day review and comment period at least 90 days prior to establishment of the Fund. The Lessee must resolve all comments on the report to BOEM's satisfaction before implementation of the Fund. The Lessee must then submit to BOEM evidence of the implementation of the Fund including: A description of any implementation details not covered in the report to BOEM regarding the mechanism established to compensate for losses to commercial	COMFIS-6, Fisheries compensatory mitigation fund, requires that lessees establish a compensation/mitigation fund to compensation commercial and for-hire recreational fishermen for loss of income resulting from displacement from fishing grounds due to project construction and operations. COMFIS-6 also allows for compensation to shoreside businesses for losses indirectly related to project development. Revenue exposure data compiled by NOAA/NMFS attempt to capture both commercial and party/charter information. In current draft T&Cs, these data are the minimum basis for Direct Compensation Program funding. BOEM anticipates that shoreside service expected exposed revenue be based off a multiplier on the commercial and for-hire recreational fishing revenues to ensure proper funds are available. However, it should be incumbent upon the shoreside business or service to verify its loss. A new RP (COMFIS-7) was created in response to comments received on the Draft PEIS to encourage lessees’ participation in the Fisheries Compensation Fund. BOEM does not preclude the lessees of the NY Bight from using a regional fund administrator, provided the requirements set forth from BOEM are met. BOEM recognizes the advantages of a single fund, yet also recognizes that a lessee may prefer to set the terms of a fund for its individual project. BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.

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	and for-hire recreational fishermen and shoreside businesses resulting from all phases of the project development on the lease area (pre-construction construction operation and decommissioning);The Fund charter including the governance structure audit and public reporting procedures and standards for paying compensatory mitigation for impacts on fishers and related shoreside businesses from lease area development; and Documentation regarding the funding account including the dollar amount establishment date financial institution and owner of the account. ACP Comment: BOEM should defer to the planned multi-state offshore wind comprehensive fisheries compensatory mitigation fund being developed to ensure standardization of the claims process and mitigation across projects. Additional clarification is needed on shoreside businesses. Quantifying losses for shoreside businesses and compensating for those losses is very difficult. Before a condition includes required compensation for shoreside businesses a demonstrated loss should be shown. "For losses to commercial and for-hire recreational fishermen the Fund must be based on the revenue exposure". Basing calculations on revenue exposure seems to assume that commercial fishing would be excluded from offshore wind facilities which is not anticipated. That assumption may result in higher compensation levels than are expected to occur.	
BOEM-2024-0001-0446-0009-b	COMFIS-6 Fisheries Surveys Guidelines directs lessees to address certain criteria when designing pre during- and post-construction fisheries monitoring survey plans. But there are no evaluations or audits required for the administration of the Fisheries' compensatory mitigation fund. This fund is intended to "compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity resulting from displacement from fishing grounds due to project construction and operations" but without some independent post-compensation assessment there will not be data to understand whether displacement occurred and whether the compensation effectively mitigated displacement impacts. There should be some-type of post-compensation audit.	Current T&Cs note reporting requirements. While there can be differences between individual T&Cs, the general requirements typically include providing the following on an annual basis: the fund charter (including the governance structure), audit and public reporting procedures, documentation regarding the funding account (including the dollar amount, establishment date, financial institution, and owner of the account), and standards for paying compensatory mitigation for direct impacts on commercial and for-hire fishers and related shoreside businesses resulting from all phases of project development on the lease area (post-COP pre-construction, construction, operation, and decommissioning), and the number of claims processed, approved, and denied. The lessee must also publicly report an annual audit.

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		In addition, BOEM recommends that lessees work with state and federal fisheries management agencies to explore the need and methods to monitor changes in fishing activity as a result of proposed offshore wind energy development. Separately, BOEM provides recommendations for conducting and reporting the results of baseline collection studies in separate guidelines: https://www.boem.gov/Survey-Guidelines/ (per the Draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf). BOEM may also modify the measures at the COP-specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations.
BOEM-2024-0001-0447-0006	The Appendix G COMFIS-6 AMMM leaves the analysis for determining losses to shoreside businesses from the proposed projects to the developer. This is unacceptable. It is BOEM's responsibility under NEPA to analyze the socioeconomic impacts of actions that it is proposing. The AMMM details that the developer must submit a report of its analysis to BOEM subject to BOEM's approval but this takes the entire analysis process out of the public process and precludes public comment on the document/plan. This is unacceptable. Shoreside businesses should have the opportunity to see how the analysis of impacts to our vessels and supporting processing facilities is being conducted and the opportunity to comment on such; it should not be a process conducted behind closed doors between BOEM and developers. As part of the federal public process analyzing socioeconomic impacts mandated by NEPA the analysis should be conducted by BOEM and be part of the public NEPA process. Additionally the AMMM specifies that the Lessee may use BOEM's Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries in developing its analysis for shoreside impacts. There are two problems with this: (1) The document is a Draft document which has never addressed the myriad of responses as to its inadequacies; a Draft should not be the authoritative definition of a NEPA mitigation measure and (2) One of the most egregious sections of the Draft was its extremely errant section on	Thank you for your comment. COMFIS-6, Fisheries compensatory mitigation fund, also allows for compensation to shoreside businesses for losses indirectly related to project development. Revenue exposure data compiled by NOAA/NMFS attempt to capture both commercial and party/ charter information. In current draft T&Cs, these data are the minimum basis for Direct Compensation Program funding. BOEM anticipates that shoreside service expected exposed revenue be based off a multiplier on the commercial and for-hire recreational fishing revenues to ensure proper funds are available. However, it should be incumbent upon the shoreside business or service to verify its loss. Additional project- and site-specific analysis will be conducted during the COP-specific NEPA review, which may result in revised, additional, or different AMMM measures. The lessees are encouraged to use BOEM’s draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585. BOEM anticipates also recommending the guidance once it is finalized, which will help avoid, minimize, and mitigate impacts on fisheries.

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	shoreside impacts. That cannot be part of a developer analysis; that must be conducted by BOEM itself.	
BOEM-2024-0001-0452-0012	H. Shortfalls of Fisheries Compensation Measure The fisheries compensatory mitigation measure (COMFIS-6) does not provide clear and adequate requirements for a compensation fund. Lessees "may use BOEM's draft Guidance for Mitigation Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf..."(emphasis added). [Footnote 18: Draft PEIS Appendix G p. G-7.] First RODA and numerous fishing associations businesses and community members have provided detailed comments on the shortcomings of the draft Guidance and incorporate those comments in full by reference above. It is unclear how a PEIS could rely on a draft agency document before the mandatory public comment process has been completed and before that document has incorporated any input from the affected parties. Second a developer could propose a compensation plan that varies from the BOEM's Guidance (which would only be supported by the fishing industry if it is significantly improved) or greatly undervalues the costs and losses associated with project development by developing an alternative plan. The vagueness of COMFIS-6 is concerning because it suggests that appropriate level of compensation funding is unlikely as it is left to the discretion of the developer. Furthermore it undermines BOEM's own argument that compensatory mitigation will drive a reduction in impacts to fisheries. How can BOEM claim that there will be a reduction in impacts through compensation if there are no clear requirements to provide sufficient funding much less any known calculation of what sufficient funding might even be. It bears repeating compensation must not be the primary means of mitigating impacts from offshore wind development.	Thank you for your comment. BOEM agrees that compensatory mitigation is last step in the mitigation hierarchy. The project-specific COP NEPA stage will evaluate potential impacts on commercial fisheries and potential site-specific AMMM measures. COMFIS-6, Fisheries compensatory mitigation fund, requires that lessees establish a compensation/mitigation fund to compensation commercial and for-hire recreational fishermen for loss of income resulting from displacement from fishing grounds due to project construction and operations. The lessees are encouraged to use BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585. BOEM anticipates also recommending the guidance once it is finalized, which will help avoid, minimize, and mitigate impacts on fisheries.
BOEM-2024-0001-0452-0006	B. Over Reliance on Compensation. The draft PEIS states for commercial fisheries and for-hire recreational fishing under Alternative C "(t)he AMMM measures would compensate for loss of income due to unrecovered economic activity and to shoreside businesses for losses indirectly related to the expected development." [Footnote 13: Draft PEIS p. 2-32.] While RODA supports appropriate compensation for losses and increased costs to the fishing industry when those losses cannot otherwise be avoided	Thank you for your comment. BOEM agrees that compensatory mitigation is last step in the mitigation hierarchy. The project-specific COP NEPA stage will evaluate potential impacts on commercial fisheries and potential site-specific AMMM measures.

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	[Bold: compensation cannot be the primary recourse for impact reduction and mitigation.] "(A) reduction driven largely by the compensatory mitigation that would mitigate impacts on Commercial and recreational fishing operations" [Footnote 14: Id. p. 2-33.] demonstrates that BOEM's analysis is vastly overly reliant on compensation rather than mandated or even suggested steps to avoid minimize and mitigate through project design parameters or alternative mitigation programs to reduce impacts to fisheries.	
BOEM-2024-0001-0346-0005	3. The AMMMs in the Draft PEIS Do Nothing To Protect Fisheries or Fishing Grounds The AMMMs in the draft PEIS for commercial fishing are vague and weak especially when compared to alternatives BOEM considered and rejected without analysis. In a rare moment of candor the PEIS explained the reduction of projected fishery impacts from major to moderate following application of thee AMMMs was driven "largely" by inclusion of a fishery compensation plan. (3.6.1-56) Compensation of course is the last step in the NEPA mitigation hierarchy it's the step to take when all else fails. The fishing industry has repeatedly asked BOEM to provide for effective AMMMs that could forestall the need for compensation. But the AMMMs do not achieve this goal. For instance the fisheries impact minimization alternative is labeled as considered and rejected because "AMMMs analyze the benefits of consistent turbine layouts across adjacent lease areas as well as increased spacing as ways to reduce impacts." (2- 20) However in the fisheries impact analyses under "presence of structures" the Draft PEIS explains these AMMMs as designed have little utility: MUL-23 and MUL-25 are designed to analyze turbine layout in order to resolve potential impacts on environmental resources including commercial fisheries These measures however are unlikely to change the impact rating of the IPF because the impact from long-term reef and hydrodynamic effects from the presence of structures would remain the same and would exist for any sited locations post-installation. Therefore these potential impacts are unlikely to differ under Alternative C as compared to Alternative B.	Thank you for your comment. Site-specific AMMM details will be analyzed at the COP-specific NEPA stage, including fishing grounds and EFH. Consultations will still happen at the COP-specific NEPA stage and additional AMMM measures may be added as a result of those consultations.
BOEM-2024-0001-0347-0004-h	OU-7: Again mitigating the impacts of OSW on federal fisheries Surveys is a primary concern of ours. Mitigation efforts for fisheries surveys must be scientifically sound and robust enough to preserve	Thank you for your comment. BOEM is continuing to work on federal fisheries survey mitigation and will continue to work with the lessees on implementing federal fisheries' survey guidance.

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	these surveys' time series. We have been encouraged by the efforts of NOAA Fisheries and BOEM to address this impact but time will tell how effective these efforts prove. We encourage innovative approaches that involve fishing communities to address the preclusion of traditional survey methods.	
BOEM-2024-0001-0439-0090	Measure ID: OU-7 Measure Name: Federal Survey Mitigation Program Description: There are NMFS scientific surveys that overlap with wind energy development in the northeast region. Consistent with NMFS and BOEM survey mitigation strategy actions 1.3.1 1.3.2 2.1.1 and 2.1.2 in the NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy Northeast US Region (Hare et al. 2022) [Footnote 19: Hare J.A. Blythe B.J. Ford K.H. Godfrey-McKee S. Hooker B.R. Jensen B.M. Lipsky A. Nachman C. Pfeiffer L. Rasser M. and Renshaw K. 2022. NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy - Northeast US Region. NOAA Technical Memorandum 292. Woods Hole MA. 33 pp.] within 120 days of COP approval the Lessee must submit to BOEM a survey mitigation agreement between NMFS and the Lessee. The survey mitigation agreement must describe how the Lessee will mitigate the project impacts on the NMFS surveys. The Lessee must conduct activities in accordance with such agreement. If the Lessee and NMFS fail to reach a survey mitigation agreement then the Lessee must submit a survey mitigation plan to BOEM and NMFS that is consistent with the procedures described below within 180 days of COP approval. BOEM will review the survey mitigation plan in consultation with NMFS Northeast Fisheries Science Center (NEFSC) and the Lessee must resolve comments to BOEM's satisfaction and must conduct activities in accordance with the plan. As soon as reasonably practicable but no later than 30 days after the issuance of the project's COP approval the Lessee must initiate coordination with NMFS NEFSC to develop the survey mitigation agreement described above. Mitigation activities specified under the agreement must be designed to mitigate the project impacts on the NMFS NEFSC surveys that overlap with the project. At a minimum the survey mitigation agreement must describe actions and the means to address impacts on the affected surveys due to the preclusion of sampling platforms and impacts on statistical designs. NMFS has determined that the	Thank you for your comment. BOEM is continuing to work on federal fisheries survey mitigation and will continue to work with the lessees on implementing federal fisheries' survey guidance.

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	project area is a discrete stratum for surveys that use a random stratified design. This agreement may also consider other anticipated project impacts on NMFS surveys such as changes in habitat and increased operational costs due to loss of sampling efficiencies. The survey mitigation agreement must identify activities that will result in the generation of data equivalent to data generated by NMFS' affected surveys for the duration of the project. The survey mitigation agreement must describe the implementation procedures by which the Lessee will work with NEFSC to generate share and manage the data required by NEFSC for each of the surveys impacted by the project as mutually agreed upon between the Lessee and NMFS/NEFSC. The survey mitigation agreement must also describe the Lessee's participation in the NMFS NEFSC Northeast Survey Mitigation Program to support activities that address regional-level impacts for the surveys. Previously Applied as a COP T&C: Check Category: ACP Comment:120 days post COP-approval is not enough time for the lessee to come to a survey mitigation agreement with NMFS. This condition should be modified to provide more time for the development of the agreement. This measure requires that Federal survey mitigation is handled on a project-by-project basis. NOAA and BOEM should work with the offshore wind industry to incorporate lessons learned from the survey mitigation programs and agreements currently under development and then develop a comprehensive plan industry wide to ensure consistency in mitigation of Federal surveys.	
BOEM-2024-0001-0332-0013	6) Mitigation Financial Compensation Last but certainly not least I attended a meeting in July 12 2022 BOEM Draft Fisheries Mitigation Guidance Document Meeting and have tried to stay up to date on the process of this document. At the time the Fishing Tackle Retail Bait & Tackle Tackle Manufacturers Boat Builders and ancillary businesses were completely left out of consideration for financial compensation in the event of lost income as a result of offshore wind development. Still today I believe this is completely absurd. Congress must give BOEM more direct authority to fund mitigation. The Economic Contributions of Recreational Fishing [Embedded Hyperlink: https://asafishing.org/economic-impacts-of-recreational-fishing/] by the American Sportfishing Association in partnership	Thank you for your comment. COMFIS-6, Fisheries compensatory mitigation, requires that lessees establish a compensation/ mitigation fund that includes for-hire recreational fishermen. COMFIS-6 should also allow for compensation to shoreside businesses for losses indirectly related to project development.

Comment No.	Comment	Response
	with the Southwicks Associates (for over 30 years the leading market research and economics firm specializing in hunting sportfishing and the outdoor recreation markets) must be included in the DPEIS. The recreational fishing industry is an economic engine that is very much overlooked by BOEM and the entire offshore wind development processes. DPEIS 3.6.1 2-32: "Fishing could experience substantial disruptions indefinitely even with implementation of the AMMM measures. The AMMM measures would compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity and to shoreside businesses for losses indirectly related to the expected development; provide monetary compensation for lost gear or income. Other AMMM measures propose the development of monitoring plans or adaptive management plans that would increase data and knowledge that might facilitate the development of future mitigation. "Impacts very well take years to manifest and the fishing industry as a whole must be included in this mitigation package. FURTHERMORE mitigation payments must come from top line revenue ONLY! They should not be passed along to ratepayers!	
BOEM-2024-0001-0450-0056	5) Require reporting and appropriate disposition of recovered fishing gear. a) Report recovered fishing gear to NMFS and the relevant state agency. Consult with those agencies to arrange for the return or disposal of the gear at a suitable location prioritizing the physical recycling of materials (as opposed to incineration).	BOEM has reviewed the suggested AMMM measure and determined that it is out of scope for this PEIS because the RPDE does not consider floating offshore wind structures.
BOEM-2024-0001-0332-0013	6) Mitigation Financial Compensation Last but certainly not least I attended a meeting in July 12 2022 BOEM Draft Fisheries Mitigation Guidance Document Meeting and have tried to stay up to date on the process of this document. At the time the Fishing Tackle Retail Bait & Tackle Tackle Manufacturers Boat Builders and ancillary businesses were completely left out of consideration for financial compensation in the event of lost income as a result of offshore wind development. Still today I believe this is completely absurd. Congress must give BOEM more direct authority to fund mitigation. The Economic Contributions of Recreational Fishing [Embedded Hyperlink: https://asafishing.org/economic-impacts-of-recreational-fishing/] by the American Sportfishing Association in partnership	The suggested AMMM measure is beyond the scope of this PEIS and beyond BOEM's jurisdictional authority.

Comment No.	Comment	Response
	with the Southwicks Associates (for over 30 years the leading market research and economics firm specializing in hunting sportfishing and the outdoor recreation markets) must be included in the DPEIS. The recreational fishing industry is an economic engine that is very much overlooked by BOEM and the entire offshore wind development processes. DPEIS 3.6.1 2-32: "Fishing could experience substantial disruptions indefinitely even with implementation of the AMMM measures. The AMMM measures would compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity and to shoreside businesses for losses indirectly related to the expected development; provide monetary compensation for lost gear or income. Other AMMM measures propose the development of monitoring plans or adaptive management plans that would increase data and knowledge that might facilitate the development of future mitigation. "Impacts very well take years to manifest and the fishing industry as a whole must be included in this mitigation package. FURTHERMORE mitigation payments must come from top line revenue ONLY! They should not be passed along to ratepayers!	

Table P.5.23-13. Responses to Substantive Comments on Mitigation and Monitoring—Birds and Bats (BIR, BB)

Comment No.	Comment	Response
BOEM-2024-0001-0325-0006	Current understanding of bats in the offshore and activity rates do not account for potential attraction to offshore wind turbines. Attraction to turbines is thought to be a significant factor in the rate of fatalities observed at onshore wind turbines and may be more significant in the offshore environment (Guest et al. 2022 Jonasson et al. 2024). Any assessment of risk to bats must account for the potential of attraction. Early offshore wind energy development should study attractive forces of turbines for bat activity to help inform risk and minimization measures of future wind energy projects. Offshore wind turbine development poses risks to bat populations although the extent of risk is unclear. We encourage BOEM to include detailed survey and analysis of the risk that wind turbines pose to bats in these environments in the Proposed Action as well as require mitigation measures that minimize bat mortality.	Acoustic detection is already occurring for other offshore wind projects and this information will inform appropriate mitigation measures for the NY Bight project-specific COP NEPA reviews. Mitigation measures for onshore wind farms may not be appropriate for the offshore environment, including feathering turbine blades or curtailment. BB-3 requires that data be made available in NABat.

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	These include: [Bold: Feather turbine blades below the manufacturer's cut-in speed.] The practice of feathering blades below manufacturer's cut-in speed can reduce fatalities of bats by approximately 30% at land-based wind energy facilities. Feathering is considered a best practice because it has negligible impact to wind energy production and reduces risk to bats. To maximize reduction of risk to bats feathering should be standard practice during all times of year when bats are active. Feathering turbines should be done day and night to maximize potential benefits for bats and birds. [Bold: Acoustically Monitor bat activity at a subset of turbines] monitor acoustic bat activity at turbines using ultrasonic acoustic detectors at a subset of turbines. Monitoring should take place day and night (Willmott et al. 2023). Data should be made available to NAbat and analyzed to describe acoustic exposure rates (Peterson et al. 2021). This would be similar for recommendations to monitor marine mammals using long term passive acoustics (MM-3). [Bold: Minimize mortality exposure through curtailment]. Currently curtailment is the only effective measure that reduces bat mortality at wind turbines and is effective across land-based wind energy facilities with an estimated average 33% decrease in bat mortality with every 1 m/s increase in cut-in speed above the manufacturer's cut-in speed (Whitby et al. 2021). The use of refined curtailment schedules (so-called "smart curtailment") that are based on real-time shut- down response to bat activity measured with either acoustic or video presence mayo reduce power loss compared to curtailment regimes based only on pre-defined wind-speed and seasonal activity periods. Efficacy of different curtailment regimes have yet to be tested in offshore environments and deserve further research attention. We do not encourage the incorporation of current acoustic deterrents as a feasible minimization tool. Acoustic deterrents have had mixed effects and in some cases act as an attractant and increase bat mortality (Schirmacher et al. 2016 Romano et al. 2019 Weaver et al. 2020). Furthermore ultrasonic acoustic deterrents have high attenuation rates and as such can transmit limited distances that will not cover the full rotor swept area and also may be perceived by bats at too close of a distance to allow them to effectively maneuver away from the turbine itself. Development and careful study of	

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	acoustic deterrents that effectively cover the entirety of the rotor-swept area could be warranted but current technology does not appear sufficient. When alternative actions are evaluated the concept of no net loss should apply even if it changes the financial forecast or energy yield assessments of a project. For curtailment alternatives impact to electrical generation at proposed cut-in speeds can be evaluated using energy production curves and historical wind speed data.	
BOEM-2024-0001-0439-0033	Measure ID: BB-1 Measure Name: Immediate reporting of injured/dead ESA-listed bird and bats Description: Any occurrence of dead or injured ESA-listed birds or bats must be reported to BOEM BSEE and USFWS as soon as practicable (taking into account crew and vessel safety) ideally within 24 hours and no more than 72 hours after the sighting. If practicable the Lessees must carefully collect the dead specimen and preserve the material in the best possible state contingent on the acquisition of any necessary wildlife permits and compliance with the Lessees' health and safety standards. Previously Applied as a COP T&C: Check ACP Comment: BOEM should not be requiring or recommending the collection of dead birds. This is a significant health safety and environmental hazard as avian flu is a significant global concern.[Footnote 5: https://www.cdc.gov/flu/avianflu/index.htm] Dead birds should not be stored on offshore industry vessels.	The health and safety standards part of BB-1 offers flexibility to collection of dead birds. As stated in BB-1, the collection and preservation of dead specimens is “contingent on the acquisition of any necessary wildlife permits and compliance with the lessees’ health and safety standards.”
BOEM-2024-0001-0450-0077	Measure ID and Name: BB-1 Immediate Reporting of Injured/Dead ESA-listed Bird and Bats Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):Any occurrence of dead or injured ESA-listed birds or bats must be reported to BOEM BSEE and USFWS as soon as practicable (taking into account crew and vessel safety) ideally within 24 hours and no more than 72 hours after the sighting. If practicable the Lessees must carefully collect the dead specimen and preserve the material in the best possible state contingent on the acquisition of any necessary wildlife permits and compliance with the Lessees' health and safety standards. Notes: We support this measure but note that BOEM should add the requirement that these reports be promptly made publicly available. See MUL-21 below regarding	BOEM is currently exploring options to facilitate sharing the information collected under BB-1.

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	employing best available technology which could facilitate better documentation of fatalities and injuries.	
BOEM-2024-0001-0439-0034	Measure ID: BB-2Measure Name: Injured/dead bird and bat reporting Description: Lessees must submit an annual report covering each calendar year due by January 31 documenting any dead or injured birds or bats found on vessels and structures during construction operations and decommissioning in the preceding year. The report must be submitted to BOEM BSEE and USFWS. The report must contain the following information: the name of species date found location a picture to confirm species' identity (if possible) and any other relevant information. Carcasses with federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory. ACP Comment: BOEM should be cognizant of the increasing number of reports being required. This creates a significant burden on lessees and as well as agencies who must review these reports. BOEM should analyze whether the new reporting requirements reduce impacts to resources and compare any benefits of those requirements to the burden imposed on industry.	Given the infancy of U.S. offshore wind development, there is some level of uncertainty regarding bird and bat collision risk (see more information in PEIS Appendix E). Therefore, it is important that BOEM continue to collect information regarding this risk, as the information will inform appropriate mitigation measures for future COP-specific NEPA reviews. BB-2 is an AMMM measure that has been included in previous BOEM COP approvals on the Atlantic OCS and will continue to be an AMMM measure that BOEM requires as U.S. offshore wind continues to develop.
BOEM-2024-0001-0450-0078	Measure ID and Name: BB-2 Injured/Dead Bird and Bat Reporting Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):Lessees must submit an annual report covering each calendar year due by January 31 documenting any dead or injured birds or bats found on vessels and structures during construction operations and decommissioning in the preceding year. The report must be submitted to BOEM BSEE and USFWS. The report must contain the following information: the name of species date found location a picture to confirm species' identity (if possible) and any other relevant information. Carcasses with federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory. Notes: We support this measure but note that BOEM should add the requirement that these reports be promptly made publicly available. See MUL-21 below regarding employing best available technology which could facilitate better documentation of fatalities and injuries.	BOEM is currently exploring options to facilitate sharing the reports that would be submitted under BB-2.

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BOEM-2024-0001-0439-0035	Measure ID: BB-3 Measure Name: Bird and bat monitoring Description: Bird and Bat Post-Construction Monitoring Plan. The Lessees must develop and implement a Bird and Bat Post-Construction Monitoring Plan (BBPCMP) based on the Lessees' Bird and Bat Post-Construction Monitoring Framework (BB-4) in coordination with BSEE USFWS and appropriate state agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches consideration of new monitoring technologies and/or additional periods of monitoring. Prior to or concurrent with offshore construction activities the Lessees must submit a BBPCMP for BOEM BSEE and USFWS review. BOEM BSEE and USFWS will review the BBPCMP and provide any comments on the plan within 60 days of its submittal. The Lessees must resolve all comments on the BBPCMP to the satisfaction of BOEM and BSEE before implementing the plan and prior to the commissioning of WTG operations. The goals of the BBPCMP will be: (1) to advance understanding of how the target species utilize the offshore airspace and do (or do not) interact with the wind farm; (2) to improve the collision estimates from the Stochastic Collision Risk Assessment for Movement (SCRAM) (or its successor) for listed bird species; and (3) to inform any efforts aimed at minimizing collisions or other project effects on target species. Monitoring. The Lessees must conduct monitoring as outlined in the Bird and Bat Post-Construction Monitoring Plan which shall include use of radio-tags to monitor movement of ESA-listed birds in the vicinity of the project. The BBPCMP will allow for changing methods over time in order to regularly update and refine collision estimates for listed birds. Specific to this purpose the plan shall include an initial monitoring phase involving deployment of Motus radio tags on listed birds in conjunction with installation and operation of Motus receiving stations on WTGs in the Lease Area following offshore Motus recommendations (https://motus.org/groups/atlantic-offshore-wind/). The initial phase may also include deployment of satellite-based tracking technologies (e.g. Global Positioning System [GPS] or Argos tags). The monitoring shall also include digital aerial surveys to monitor avoidance behavior and densities. Annual Monitoring Reports. The Lessees must submit to BOEM (at	Thank you for your comment. BB-3 has been revised.

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	renewable_reporting@boem.gov) USFWS and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within12 months. The report must include all data analyses and summaries regarding ESA-listed and non-ESA-listed birds and bats. BOEM BSEE and the USFWS shall use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the BBPCMP. BOEM and BSEE reserve the right to require reasonable revisions to the BBPCMP and may require the use of new technologies as they become available for use in offshore environments. Post-Construction Quarterly Progress Reports. The Lessees must submit quarterly progress reports during the implementation of the BBPCMP to BOEM (at renewable_reporting@boem.gov) BSEE and USFWS by the 15th day of the month following the end of each quarter during the first full year that the project is operational. The progress reports must include a summary of all work performed an explanation of overall progress and any technical problems encountered. Monitoring Plan Revisions. Within 30 days of submitting the annual monitoring report the Lessees must meet with BOEM BSEE USFWS and appropriate state agencies to discuss the following: the monitoring results; the potential need for revisions to the BBPCMP including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If based on this annual review meeting BOEM in consultation with USFWS determines that revisions to the BBPCMP are necessary BOEM will require the Lessees to modify the BBPCMP. If the projected collision levels as informed by monitoring results deviate substantially from the effects analysis the Lessees must transmit recommendations for new mitigation measures and/or monitoring methods to BOEM. The frequency duration and methods for various monitoring efforts in future revisions of the BBPCMP will be determined adaptively based on current technology and the evolving weight of evidence regarding the likely levels of collision mortality for each listed bird species. The effectiveness and cost of various technologies/methods will be key considerations when revising the plan. Grounds for revising the BBPCMP include but are not limited to: (i) greater than expected	

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	levels of collision of listed birds; (ii) evolving data input needs for SCRAM (or its successor); (iii) changing technologies for tracking or otherwise monitoring listed birds in the offshore environment that are relevant to assessing collision risk; (iv) new information or understanding of how listed birds utilize the offshore environment and/or interact with wind farms; and (v) coordination and alignment of tracking monitoring and other data collection efforts for listed birds across multiple wind farms/leases on the OCS. The Lessees shall continue implementation of appropriate monitoring activities for listed birds (under the current and future versions of the BBPCMP) until one of the following occurs: (i) the WTGs cease operation; (ii) USFWS concurs that a robust weight of evidence has demonstrated that collision risks to all listed birds from WTG operations are negligible (i.e. the risk of take from WTG operation is discountable); or (iii) USFWS concurs that further data collection is unlikely to improve the accuracy or robustness of collision mortality estimates and is unlikely to improve the ability of BOEM and the Lessee to reduce or offset collision mortality. Operational Reporting (Operations). The Lessees must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition data for all WTGs together in tabular format: the proportion of time the WTGs were operational (spinning at >x revolutions per minute [rpm]) each month the average rotor speed (rpm) of spinning WTGs plus 1 standard deviation and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. Any operational data considered by the Lessee to be privileged or confidential must be clearly marked as confidential business information and will be handled by BOEM and BSEE in a manner consistent with 30 CFR 585.114. Raw Data. The Lessees must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to BOEM BSEE and USFWS upon request for the duration of the lease. The Lessees must work with BOEM to ensure the data are publicly available. All avian tracking data (i.e. from radio and satellite transmitters) must be stored managed and made	

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	available to BOEM BSEE and USFWS following the protocols and procedures outlined in the agency document entitled Guidance for Coordination of Data from Avian Tracking Studies or its successor applicable at the time the particular data is being stored. All bat data must be stored in NBat. Previously Applied as a COP T&C: Check ACP Comment: In general the NY Bight Draft PEIS states that for birds and bats presence in the offshore environment is anticipated to be low and the AMMM measures may not significantly reduce impacts. Therefore additional measures should not be necessary. Additional concerns with this measure include: Monitoring: Digital aerial surveys should not be a required monitoring measure and it has not been a standard measure for COP approval. Other monitoring measures can be more effective and less onerous. Annual Reports: BOEM/BSEE requirements for the use of new technologies is very open-ended and does not speak to economic and technical viability. Care needs to be taken to not double count quarterly and annual reports in agency tracking systems. Monitoring Plan Revisions: BOEM/BSEE requirements for the use of new technologies is very open-ended and does not speak to economic and technical viability. The rigorous fatality studies needed to estimate fatality rates cannot be done in an offshore environment. Operating Reporting: This is a huge dataset. Lessees should be able to provide data snapshots rather than the entirety of the operations.	
BOEM-2024-0001-0446-0009-c	b. Address inconsistencies between monitoring requirements for different AMMMs. Consider that AMMM measure BB-3 Bird and Bat Post-Construction Monitoring Plan sets ambitious goals (1) to [Bold: advance understanding] of how the target species utilize the offshore airspace (or do not) and interact (or do not) with the wind farm; (2) to [Bold: improve the collision estimates] from the Stochastic Collision Risk Assessment for Movement (SCRAM) (or its successor) for listed bird species; and (3) to [Bold; inform any efforts] aimed at minimizing collisions or other project effects on target species. See Vol. II Appendix G BB-3 at G-3-5.	Thank you for your comment.
BOEM-2024-0001-0450-0013	A. BB-3 Bird and Bat Monitoring. We strongly support expectations detailed in the Bird and Bat Post-Construction Monitoring Plan (BBPCMP) to require reporting that will enable deciding "the need for adjustments to monitoring approaches consideration of ne”w	BOEM has revised BB-3 to include potential integrated multi-sensor systems. BOEM is currently monitoring the best available science and technology and could revisit identification of such at the project-level COP NEPA review and consultation stage.

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	monitoring technologies and/or additional periods of monitoring" (emphasis supplied). [Footnote 41:Id.] Such adjustments help conform to best practices identified for implementing adaptive monitoring during environmental impact assessments of wind energy projects on wildlife. [Footnote 42: Copping AE et al. 2020. Enabling renewable energy while protecting wildlife: An ecological risk-based approach to wind energy development using ecosystem-based management values. Sustainability 12:9352.] And we agree fully with: "Grounds for revising [current and future versions of the BBPCMP] include but are not limited to: (i) greater than expected levels of collision of listed birds; (ii) evolving data input needs for SCRAM (or its successor); (iii) changing technologies for tracking or otherwise monitoring listed birds in the offshore environment that are relevant to assessing collision risk; (iv) new information or understanding of how listed birds utilize the offshore environment and/or interact with wind farms; and (v) coordination and alignment of tracking monitoring and other data collection efforts for listed birds across multiple wind farms/leases on the [Atlantic] OCS." [Footnote 43: BOEM 2024 p. G-4.] The NY Bight Draft PEIS requires Lessees to use Motus tags coupled with receiving stations to monitor certain ESA-listed birds in the project vicinity. [Footnote 44: Id.] Where possible GPS tracking also should be used for monitoring. Satellite-uploading GPS transmitters weighing 4 g are commercially available so any individual bird or bat weighing 133 g could be tracked using GPS without exceeding the conventionally accepted 3% body mass threshold for ideal transmitter weight. Transmitter weight will likely decrease even further over time as transmitters weighing 1 g (suitable for a 33 g animal) are in development. We are thus pleased to see that "[t]he initial phase [of the BBPCMP] may also include deployment of satellite-based tracking technologies (e.g. Global Positioning System [GPS] or Argos tags)." [Footnote 45: Id.] Good justifications may exist too for tracking non-listed avian species. In cases where welfare concerns or outright rarity discourage movement studies of listed species non-listed substitutes can be used (e.g. Common Terns for Roseate Terns). [Footnote 46: Loring PH Paton PWC McLaren JD Bai H Janaswamy R Goyert HF Griffin CR Sievert PR. 2019. Tracking offshore occurrence of Common	

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	Terns endangered Roseate Terns and threatened Piping Plovers with VHF arrays. [Online.] Available at https://espis.boem.gov/final%20reports/BOEM_2019-017.pdf] Similarly marine bird species for tagging priorities include those that are globally imperiled under the IUCN Red List but not listed under the U.S. ESA because of delays or because they breed elsewhere. [Footnote 47: Trindade Petrel Pterodroma arminjoniana about as rare as the recently ESA-listed Black-capped Petrel P. hasitata also occurs in U.S. waters but breeds elsewhere: Krger L Paiva VH Petry MV Montone RC Ramos JA. 2018. Population estimate of Trindade Petrel Pterodroma arminjoniana by the use of predictive nest habitat modelling. Bird Conservation International 28:197207.] Regardless of listing status species with high vulnerability to offshore wind or uncertain population trends should be included in tracking studies to better measure migratory connectivity and determine the appropriate locations for population monitoring. As articulated in this Draft PEIS the monitoring (under BB-3) [Footnote 48: BOEM 2024 p. G-4.] does not detail adequately how all bird or bat traffic around offshore wind energy infrastructure can be assessed e.g. for nocturnally-active species. [Footnote 49: Some nocturnal activity about migratory birds species however may be detected from the use of additional kinds of acoustic sensors that are deployed at the project site. In general acoustic-only systems are limited in ability to detect all bird taxa and they will not fully measure the actual migration or movement volumes as do and can radar-based detection systems.] Motus receiving towers while valuable can help identify only those fortuitously-tagged birds that happen to pass through the turbine area. Moreover acoustic sensors cannot reliably count large flocks identify migrating birds that do not call in-flight or separate those species that have very similar calls. [Footnote 50: Sanders CE Menhill DJ. 2014. Acoustic monitoring of nocturnally migrating birds accurately assesses the timing and magnitude of migration through the Great Lakes. Condor 116:371383.] Integrating acoustic data collection with multi-sensor camera technologies and radar systems is essential to fully detect aerial wildlife and to effectively identify all species as well as provide valuable supplementary data on the number of individuals flight speed and	

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	flight height. [Footnote 51: Horton KG et al. 2015. A comparison of traffic estimates of nocturnal flying animals using radar thermal imaging and acoustic recording. Ecological Applications 25:390401.] We are pleased to see avian displacement given a key emphasis in this PEIS: "monitoring shall also include digital aerial surveys to monitor avoidance behavior and densities." [Footnote 52: Monitoring BOEM 2024 p. G-4.] Previous research indicates marine birds respond to offshore wind infrastructure by: (1) displacement around (2) attraction to (3) or neutral association with a project's overall footprint. One large literature review of North American and European bird reactions around wind farms indicates displacement in offshore habitats to be two to three times more prevalent than attraction. [Footnote 53: Marques AT Batalha H Bernardino J. 2021. Bird displacement by wind turbines: Assessing current knowledge and recommendations for future studies. Birds 2:460475.] Across 71 peer-reviewed studies displacement distances from turbines (mean standard deviation) ranged from 116 64 m in the Anseriformes (ducks) 2517 5560 m in the Charadriiformes (gulls terns shorebirds) and 12062 6911 m in the Gaviiformes (loons). [Footnote 54: Id.] Deploying the appropriate study design(s) across all six lease areas is the key to success of detecting bird displacement using digital aerial surveys. To detect differences in avian distribution pre- and post-construction surveys must be designed and implemented to account for detection bias to adequately cover the lease area and its surroundings and to collect data at the necessary spatial and temporal resolutions. The BBPCMP for the NY Bight PEIS gives little or no mention of how to detect or estimate micro-avoidance i.e. ability of birds and bats to make last minute behavioral adjustments at small scales to avoid collision with rotors and other infrastructure. To better address both displacement and collision risk we strongly urge requirements for lessees to deploy integrated multi-sensor systems at project substations and/or at a subset of selected turbines. This will improve detection and identification of nocturnal migrants and promote better estimates of collision and avoidance rates. Designing multi-sensor systems [Footnote 55: Suryan R. et al. 2016. A Synchronized Sensor Array for Remote Monitoring of Avian and Bat Interactions with Offshore Renewable Energy Facilities (No.	

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	DOE-OSU-EE0005363). Oregon State Univ. Corvallis OR; Lagerveld S et al. 2020. Assessing fatality risk of bats at offshore wind turbines. (No. C025/20). Wageningen Marine Research.] or using commercially available integrated monitoring systems that already combine acoustic detection with radar visual camera technologies thermographic and infrared camera imaging and very high frequency (VHF) detection [Footnote 56: Willmott JR Forcey G Vukovich M. 2023. New insights into the influence of turbines on the behaviour of migrant birds: implications for predicting impacts of offshore wind developments on wildlife. Journal of Physics: Conference Series 2507:012006.] serves to facilitate collecting information for the NY Bight PEIS BBPCMP. Integrated multi-sensor systems will enable better assessment; if monitoring results significantly deviate from the effects analysis lessees must then propose new mitigation measures and/or monitoring methods to BOEM. [Footnote 57: Monitoring Plan Revisions given in: BOEM 2024 p. G-4.]	
BOEM-2024-0001-0450-0079	Measure ID and Name: BB-3 Bird and Bat Monitoring Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): Bird and Bat Post-Construction Monitoring Plan. The Lessees must develop and implement a Bird and Bat Post-Construction Monitoring Plan (BBPCMP) based on the Lessees' Bird and Bat Post-Construction Monitoring Framework (BB-4) in coordination with BSEE USFWS and appropriate state agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches consideration of new monitoring technologies and/or additional periods of monitoring. Prior to or concurrent with offshore construction activities the Lessees must submit a BBPCMP for BOEM BSEE and USFWS review. BOEM BSEE and USFWS will review the BBPCMP and provide any comments on the plan within 60 days of its submittal. The Lessees must resolve all comments on the BBPCMP to the satisfaction of BOEM and BSEE before implementing the plan and prior to the commissioning of WTG operations. The goals of the BBPCMP will be: (1) to advance understanding of how the target species utilize the offshore airspace and Bats Birds BOEM BSEE and USFWS ? Mitigation and Monitoring G-4 USDOI | BOEM Measure ID1 Measure Name Description Resource Area Mitigated Anticipated Enforcing Agency	Thank you for your comment. BOEM has revised BB-3 to include acoustic bat detectors and corrected the NABat typo.

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	Previously Applied as a COP Term and Condition do (or do not) interact with the wind farm; (2) to improve the collision estimates from the Stochastic Collision Risk Assessment for Movement (SCRAM) (or its successor) for listed bird species; and (3) to inform any efforts aimed at minimizing collisions or other project effects on target species. Monitoring. The Lessees must conduct monitoring as outlined in the Bird and Bat Post-Construction Monitoring Plan which shall include use of radio-tags to monitor movement of ESA-listed birds in the vicinity of the project. The BBPCMP will allow for changing methods over time in order to regularly update and refine collision estimates for listed birds. Specific to this purpose the plan shall include an initial monitoring phase involving deployment of Motus radio tags on listed birds in conjunction with installation and operation of Motus receiving stations on WTGs in the Lease Area following offshore Motus recommendations (https://motus.org/groups/atlantic-offshore-wind/). The initial phase may also include deployment of satellite-based tracking technologies (e.g. Global Positioning System [GPS] or Argos tags). The monitoring shall also include digital aerial surveys to monitor avoidance behavior and densities. Annual Monitoring Reports. The Lessees must submit to BOEM (at renewable_reporting@boem.gov) USFWS and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within12 months. The report must include all data analyses and summaries regarding ESA-listed and non-ESA-listed birds and bats. BOEM BSEE and the USFWS shall use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the BBPCMP. BOEM and BSEE reserve the right to require reasonable revisions to the BBPCMP and may require the use of new technologies as they become available for use in offshore environments. Post-Construction Quarterly Progress Reports. The Lessees must submit quarterly progress reports during the implementation of the BBPCMP to BOEM (at renewable_reporting@boem.gov) BSEE and USFWS by the 15th day of the month following the end of each quarter during the first full year that the project is operational. The progress reports must include a summary of all work performed an	

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	explanation of overall progress and any technical problems encountered. Monitoring Plan Revisions. Within 30 days of submitting the annual monitoring report the Lessees must meet with BOEM BSEE USFWS and appropriate state agencies to discuss the following: the monitoring results; the potential need for revisions to the BBPCMP including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If based on this annual review meeting BOEM in consultation with USFWS determines that revisions to the BBPCMP are necessary BOEM will require the Lessees to modify the BBPCMP. If the projected collision levels as informed by monitoring results deviate substantially from the effects analysis the Lessees must transmit recommendations for new mitigation measures and/or monitoring methods to BOEM. The frequency duration and methods for various monitoring efforts in future revisions of the BBPCMP will be determined adaptively based on current technology and the evolving weight of evidence regarding the likely levels of collision mortality for each listed bird species. The effectiveness and cost of various technologies/methods will be key considerations when revising the plan. Grounds for revising the BBPCMP include but are not limited to: (i) greater than expected levels of collision of listed birds; (ii) evolving data input needs for SCRAM (or its successor); (iii) changing technologies for tracking or otherwise monitoring listed birds in the offshore environment that are relevant to assessing collision risk; (iv) new information or understanding of how listed birds utilize the offshore environment and/or interact with wind farms; and (v) coordination and alignment of tracking monitoring and other data collection efforts for listed birds across multiple wind farms/leases on the OCS. The Lessees shall continue implementation of appropriate monitoring activities for listed birds (under the current and future versions of the BBPCMP) until one of the following occurs: (i) the WTGs cease operation; (ii) USFWS concurs that a robust weight of evidence has demonstrated that collision risks to all listed birds from WTG operations are negligible (i.e. the risk of take from WTG operation is discountable); or (iii) USFWS concurs that further data collection is unlikely to improve the accuracy or robustness of collision mortality estimates and is unlikely	

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	to improve the ability of BOEM and the Lessee to reduce or offset collision mortality. Operational Reporting (Operations). The Lessees must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition data for all WTGs together in tabular format: the proportion of time the WTGs were operational (spinning at >x revolutions per minute [rpm]) each month the average rotor speed (rpm) of spinning WTGs plus 1 standard deviation and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. Any operational data considered by the Lessee to be privileged or confidential must be clearly marked as confidential business information and will be handled by BOEM and BSEE in a manner consistent with 30 CFR 585.114.Raw Data. The Lessees must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to BOEM BSEE and USFWS upon request for the duration of the lease. The Lessees must Mitigation and Monitoring G-5 USDOI | BOEM Measure ID1 Measure Name Description Resource Area Mitigated Anticipated Enforcing Agency Previously Applied as a COP Term and Condition work with BOEM to ensure the data are publicly available. All avian tracking data (i.e. from radio and satellite transmitters) must be stored managed and made available to BOEM BSEE and USFWS following the protocols and procedures outlined in the agency document entitled Guidance for Coordination of Data from Avian Tracking Studies or its successor applicable at the time the particular data is being stored. All bat data must be stored in NBat. Notes: • Support adaptive monitoring outlined in the BBPCMP including adjustments new technologies and extended monitoring periods. This is a critical addition to proceeding with offshore wind development when there are unknown impacts on birds and bats and no commercially available technologies to facilitate monitoring of impacts.	

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	• Many of the provisions in the BBPCMP are limited to birds. We highly recommend that BOEM extend these to include both listed and migratory bat species including understanding how species use the air space improve collision estimates Motus tagging adaptive monitoring based on collision estimates revising monitoring based on changing technologies or new information on interactions and continued monitoring based on USFWS input. • Advocate for revising the BBPCMP based on factors like collision rates evolving technologies and new bird behavior data. Recommend Motus tags with GPS tracking for ESA-listed birds and tracking of non-listed species vulnerable to offshore wind. • Stress integrating acoustic data with radar and camera technologies for comprehensive wildlife detection. • Encourage digital aerial surveys to monitor avian displacement and densities around wind farms. • Emphasize deploying integrated multi-sensor systems for improved nocturnal migrant detection and collision rate estimation. • Suggest using commercial integrated monitoring systems for efficient data collection. • Highlight the importance of proposing new mitigation measures if monitoring results deviate significantly. • BOEM should correct the typo of "NBat" to clarify that data should be stored in NABat which we support.	
BOEM-2024-0001-0439-0036	Measure ID: BB-4 Measure Name: Bird and bat monitoring plan framework Description: Lessees must develop a framework for a Bird and Bat Post-Construction Monitoring Plan (BB-3) in coordination with BOEM and USFWS. Lessees are encouraged to include this framework with their initial COP submission or subsequent updated versions. Category: GACP Comment: This is COP guidance and is not appropriate for inclusion as an AMMM and should be removed. The inclusion of this measure is counter to the proposed action which states that "BOEM would require as conditions of approval for activities proposed by lessees in COPs submitted for the NY Bight lease areas unless future COP-specific NEPA analysis shows that implementation of such measures is not warranted or effective." The	BB-4 is now classified as an RP and no longer considered as an AMMM measure (or part of the Proposed Action) in the PEIS. Refer to response to comment BOEM-2024-0001-0371-0004 for additional information on Alternative C, the updating of AMMM measures, and RPs.

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	PEIS intends to analyze measures that can be approved as terms and conditions of plan approval for individual project specific COPs. Since this measure dictates how a COP should be developed by its very nature it could not be implemented through terms and conditions of COP approval. If BOEM wishes to implement such a measure it should be proposed for inclusion in revised COP guidance and go through the guidance development process. This process should include outreach to industry and public review and comment. However this measure should not be required in any initial or early-stage COPs. As post-construction monitoring occurs many years after COP development a monitoring framework and plan would be more appropriate for development during ESA Section 7 consultation and potentially for final COP approval.	
BOEM-2024-0001-0450-0014	B. BB-4 Bird and Bat Monitoring Plan Framework Lessees are to develop a framework for the BBPCMP alongside their submission of a COP. [Footnote 58: BOEM 2024 p. G-5.] We encourage all lessees under the NY Bight PEIS to furnish as much detail as possible for this framework and to indicate where how and why the BBPCMP can be adapted continuously to any new information or technology during all phases of post-construction operations and monitoring.	Refer to response to comment BOEM-2024-0001-0439-0036. If BB-4 is applied during a project-specific COP NEPA review, then additional details can be considered.
BOEM-2024-0001-0450-0080	Measure ID and Name: BB-4 Bird and Bat Monitoring Plan Framework Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):Lessees must develop a framework for a Bird and Bat Post-Construction Monitoring Plan (BB-3) in coordination with BOEM and USFWS. Lessees are encouraged to include this framework with their initial COP submission or subsequent updated versions. Notes: • Require lessees to develop a framework for the BBMCMP alongside their submission of a COP. • Encourage all lessees under the NY Bight PEIS to provide comprehensive detail for this framework. Emphasize the importance of indicating how and why the BBMCMP can be continuously adapted to new information or technology during all phases of post-construction operations and monitoring.	Refer to response to comment BOEM-2024-0001-0439-0036. If BB-4 is applied during a project-specific COP NEPA review, then additional details can be considered.

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BOEM-2024-0001-0357-0042	With respect to the cumulative impact on migratory birds in Enclosure IV AMMM measures should include: 1. A minimum turbine spacing of at least two nautical miles to facilitate passage through the wind turbine complex to its nesting grounds and its other migration corridors.	Based on the current literature, and as cited in the PEIS, there is no evidence that 2 nautical miles would be better than the minimum 0.6- by 0.6-nautical-mile spacing analyzed in the PEIS RPDE. For details, see the description and summary results of the Madsen et al. (2012) and Vattenfall (2023) studies cited in PEIS Sections 3.5.3.3.3 and 3.5.3.4.1, respectively.
BOEM-2024-0001-0439-0038	Measure ID: BIR-1 Measure Name: Bird-Deterrent Devices and Plan Description: To minimize attracting birds to operating WTGs the Lessees must install bird perching-deterrent device(s) on each WTG and OSS. The Lessees must submit a plan to deter perching on offshore infrastructure by roseate terns and other marine birds for BOEM and BSEE to review in coordination with USFWS and with the FIR ("Bird Perching Deterrent Plan"). BOEM and BSEE will review the Bird Perching Deterrent Plan and provide any comments on the plan within 60 days of its submittal. The Lessees must resolve all comments on the Bird Perching Deterrent Plan to the satisfaction of BOEM and BSEE before implementing the plan The Bird Perching Deterrent Plan must include the type(s) and locations of bird perching-deterrent devices and a monitoring plan for the life of the project must allow for modifications and updates as new information and technology becomes available and must track the efficacy of the deterrents. The plan must be based on best available science regarding the effectiveness of perching-deterrent devices on minimizing collision risk. The location of bird perching-deterrent devices must be proposed by the Lessees based on best management practices applicable to the appropriate operation and safe installation of the devices. The Lessees must also provide the location and type of bird-deterrent devices as part of the as-built submittals to BSEE. Previously Applied as a COP T&C: Check Category: BACP Comment: This measure should be caveated to note that deterrent devices would be subject to safety and operational risk. Tracking the effectiveness of perching-deterrent devices and their impact of minimizing collision risk would be technically and economically challenging to the developer when there are already standard practices for perching-deterrents that have proven effectiveness. This measure is adding yet another plan requirement to the current long list and significant burden of plan development	BIR-1 is an AMMM measure that has been applied as previous terms of BOEM COP approvals for offshore wind development on the Atlantic OCS and will continue to be an AMMM measure that BOEM requires as U.S. offshore wind continues to develop. Through measures like BIR-1, BOEM will continue to collect information regarding bird collision risk with WTGs to inform appropriate mitigation measures for future COP-specific NEPA reviews.

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	requirements. BOEM should consider the environmental benefit of each plan requirement in the context of the burden it places on industry and determine whether there is sufficient environmental benefit to justify the need for the plan and level of burden being imposed.	
BOEM-2024-0001-0450-0015	C. BIR-1 Bird-Deterrent Devices and Plan. We applaud steps taken to minimize perching at operating wind turbine generators (WTGs) and other offshore wind energy infrastructure a requirement to monitor effectiveness of such measures and any allowances for modifications and updates as new information and technology becomes available. [Footnote 59: BOEM 2024 p. G-5.] In addition to perching deterrents we support expanding other means to discourage birds and bats away from collision risk zones including minimizing the motion smear of spinning turbine blades and other forms of vision-based deterrence that exploits the limitations of avian visual capabilities. [Footnote 60: Martin GR Shaw JM. 2010. Bird collisions with power lines: failing to see the way ahead? Biological Conservation 143:2695 2702; Martin GR. 2022. Vision-based design and deployment criteria for power line bird diverters. Birds 3:410422; Martin GR Banks AN. 2023. Marine birds: vision-based wind turbine collision mitigation. Global Ecology and Conservation 42:e02386.] Should monitoring reveal the potential for significant impacts BOEM should consider brief temporary operational curtailment if periods of especially high collision risk can be identified with great accuracy i.e. predictably intense bird migration events can be forecast based on meteorological and avian radar data. [Footnote 61: Hayes MA Hooton LA Gilland KL Grandgent C Smith RL Lindsay SR Collins JD Schumacher SM Rabie PA Gruver JC Goodrich Mahoney J. 2019. A smart curtailment approach for reducing bat fatalities and curtailment time at wind energy facilities. Ecological Applications 29: e01881; Smallwood KS Bell DA. 2020. Effects of wind turbine curtailment on bird and bat fatalities. The Journal of Wildlife Management 84:685696; Brabant R Rumes B Degraer S. 2021. Occurrence of intense bird migration events at rotor height in Belgian offshore wind farms and curtailment as possible mitigation to reduce collision risk. Memoirs on the Marine Environment pp.	Based on current literature, there are few, if any, options to address the potential impacts on birds from motion smear. Recently, a study was conducted in Norway that indicated a reduction in bird fatalities if a turbine blade is painted black; however, the study was limited and, more importantly, FAA prohibits the painting of turbine blades other than light gray or pure white in the United States (see response to comment BOEM-2024-0001-0448-0009 for additional information). Regardless, as documented in the PEIS, bird presence on the Atlantic OCS is low and, therefore, BOEM anticipates a low risk to bird populations. Mitigation measures for onshore wind farms may not be appropriate for the offshore environment, including feathering turbine blades or curtailment, as they need to be proven effective in the onshore environments first (it is very difficult to study this offshore). As documented in PEIS Section 3.5.3, bird fatalities from onshore wind farms represent a fraction of a percentage of all bird deaths in the United States, and BOEM anticipates that bird fatalities from offshore wind farms will be substantially lower due to the much lower presence of birds offshore.

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	4760. Royal Belgian Institute of Natural Sciences Operational Directorate Natural Environment.]	
BOEM-2024-0001-0450-0081	Measure ID and Name:BIR-1Bird-Deterrent Devices and Plan Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):To minimize attracting birds to operating WTGs the Lessees must install bird perching-deterrent device(s) on each WTG and OSS. The Lessees must submit a plan to deter perching on offshore infrastructure by roseate terns and other marine birds for BOEM and BSEE to review in coordination with USFWS and with the FIR ("Bird Perching Deterrent Plan"). BOEM and BSEE will review the Bird Perching Deterrent Plan and provide any comments on the plan within 60 days of its submittal. The Lessees must resolve all comments on the Bird Perching Deterrent Plan to the satisfaction of BOEM and BSEE before implementing the plan The Bird Perching Deterrent Plan must include the type(s) and locations of bird perching-deterrent devices and a monitoring plan for the life of the project must allow for modifications and updates as new information and technology becomes available and must track the efficacy of the deterrents. The plan must be based on best available science regarding the effectiveness of perching-deterrent devices on minimizing collision risk. The location of bird perching-deterrent devices must be proposed by the Lessees based on best management practices applicable to the appropriate operation and safe installation of the devices. The Lessees must also provide the location and type of bird-deterrent devices as part of the as-built submittals to BSEE. Notes: • Continue steps to minimize perching at operating wind turbine generators (WTGs) and other offshore wind energy infrastructure. • Require monitoring of the effectiveness of perching deterrents and allow for modifications and updates as new information and technology become available. • Support expanding means to discourage birds and bats away from collision risk zones including minimizing the motion smear of spinning turbine blades and other forms of vision-based	Refer to response to comment BOEM-2024-0001-0450-0015. Through measures like BB-3, BOEM will continue to collect information regarding bird collision risk with WTGs to inform appropriate mitigation measures for future COP-specific NEPA reviews.

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	deterrence. Urge appropriate consideration of brief temporary operational curtailment during periods of especially high collision risk based on accurate forecasts of intense bird migration events using meteorological and avian radar data	
BOEM-2024-0001-0451-0004	BIR-1 Bird-Deterrent Device Plan: To minimize attracting birds to operating WTGs the Lessees must install bird perching-deterrent device(s) on each WTG and OSS This AMMM is too prescriptive. There are minimal areas where birds can perch on the WTGs. Furthermore perching deterrents have not been demonstrated to decrease collision risk to listed avian species including Roseate Terns Red Knots and Piping Plovers or other avian species. In addition perching behavior is not associated with collision risk at offshore wind facilities nor has perching on offshore wind infrastructure by Roseate Terns or other listed avian species been widely observed. This AMMM could be better phrased to require leases to only install the devices where it may be expected to be reasonably effective and where installation can be done safely.	BOEM has revised BIR-1 to include language regarding effectiveness. Language regarding safe installation of bird-deterrent devices was already present in BIR-1.
BOEM-2024-0001-0439-0039	Measure ID: BIR-2 Measure Name: Light impact reduction for birds Description: Nothing in this condition supersedes or is intended to conflict with lighting marking and signaling requirements of FAA USCG or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable including lighting designed to minimize upward illumination. The Lessee must provide USFWS with a courtesy copy of the final Lighting Marking and Signaling Plan and the Lessee's approved application to USCG to establish Private Aids to Navigation (PATON).Category: G ACP Comment: This measure is duplicative of the BOEM Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development[Footnote 6: https://www.boem.gov/sites/default/files/documents/renewable-energy/2021-Lightning-and-Marking-Guidelines.pdf] and therefore should be removed. If BOEM would like to add lighting or marking requirements or provide clarification to them they should do so through the guidance development process. This process should include outreach to industry coordination with relevant Federal agencies including FAA and USCG and public review and comment.	This is a measure that has been applied in previous COP approvals and remains an AMMM measure in the Final PEIS. As noted in BIR-2, nothing in this condition supersedes or is intended to conflict with lighting marking and signaling requirements for FAA, USCG, or BOEM.

Comment No.	Comment	Response
BOEM-2024-0001-0450-0016	D. BIR-2 Light Impact Reduction for Birds To mitigate light-driven attraction (phototaxis) on birds during assessment construction and operations in the NY Bight "measures that minimize lighting impacts on avian species [should] be implemented where feasible as approved by FAA [Federal Aviation Administration] BOEM USCG [U.S. Coast Guard] and other regulatory agencies." [Footnote 62: Maryland Offshore Wind Project Construction and Operations Plan. 2023 Appendix G: Mitigation and Monitoring p. G-6.] For coastal habitats and fauna these "lighting-related impacts will be minimized by using BMPs [best management practices] where feasible" including "minimizing lighting the onshore facility at night and down-shielded light fixtures to reduce the visibility" plus "aiming light upward and using the longest permissible off cycles[Footnote 63: Id. pp. G-9 G-18.] We strongly recommend red flashing FAA- approved lights and yellow flashing marine navigation lights on the WTGs instead of any constant white lights to further reduce bird attraction. As an additional BMP the NY Bight PEIS should extend this approach to include use of minimal lighting intensity on vessels wind turbine generators and electric service platforms wherever possible to reduce potential attraction of birds. Although lighting practices might reduce impacts to birds no provision for studying avian response(s) to lights has been made in the monitoring plan. [Footnote 64: BOEM 2024 p. G-5.]We stress that phototaxis i.e. disoriented attraction of birds drawn from some distance to lights on turbine towers creates conditions in which the bird numbers attracted scale as the square of the range from which they are drawn [Footnote 65: Deakin Z Cook A Daunt F McCluskie A Morley N Witcutt E Wright L Bolton M. 2022. A review to inform the assessment of the risk of collision and displacement in petrels and shearwaters from offshore wind developments in Scotland. Scottish Government: Riaghaltas na h-Alba. ISBN: 978-1-80525-029-6 (web only) https://www.researchgate.net/profile/Zoe-Deakin-2/publication/366139542_A_review_to_inform_the_assessment_of_the_risk_of_collision_and_displacement_in_petrels_and_shearwaters_from_offshore_wind_developments_in_Scotland/links/6393231e484e65005bf86842/A-review-to-inform-the- assessment-of-the-risk-of-collision-and-displacement-in-petrels-and-	Lessees are required to implement BOEM lighting and marking guidelines and USCG and FAA lighting and marking requirements. Nothing in BIR-2 is intended to conflict with these requirements. Red flashing FAA-approved lights and yellow flashing marine navigation lights have been recommended and required in previous COP approvals. BOEM will analyze lighting during the project-specific COP NEPA review. BOEM is unable to address lights on vessels through this Final PEIS. Navigation lights on vessels are fully within the purview of USCG and are federally mandated. They can only be modified/altered via the *Federal Register* process and by USCG. The minimal lighting request is covered within BIR-2. The commenter should consider submitting study ideas related to phototaxis to BOEM's Environmental Studies Program, which develops, funds, and manages scientific research to inform policy decisions on the development of energy and mineral resources on the OCS. Calls for study ideas are typically announced annually in November. More information about Environmental Studies Planning can be found here: https://www.boem.gov/environment/environmental-studies/environmental-studies-planning.

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	shearwaters-from-offshore-wind-developments-in- Scotland.pdf] thereby greatly increasing potential for adverse impacts (i.e. higher collision risk). In the context of collision with turbine blades the probability of collision is inflated by flux density as disoriented birds pass repeatedly through rotor swept areas. Research and monitoring are needed to measure distances at which this phototaxis operates in seabirds (especially the susceptible procellariiforms). [Footnote 66: At least 56 species of Procellariiformes more than one-third of them (24) imperiled are vulnerable to grounding caused by lights. See the synthesis in: Rodrguez A Holmes ND Ryan PG Wilson KJ Faulquier L Murillo Y Raine AF Penniman JF Neves V Rodrguez B Negro JJ. 2017. Seabird mortality induced by land based artificial lights. Conservation Biology 31:9861001.] Neither the avian risk assessment nor avian monitoring framework in the NY Bight PEIS suitably address the potential of high flux density caused by turbine-associated phototaxis.	
BOEM-2024-0001-0450-0082	Measure ID and Name: BIR-2 Light Impact Reduction for Birds Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):Nothing in this condition supersedes or is intended to conflict with lighting marking and signaling requirements of FAA USCG or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable including lighting designed to minimize upward illumination. The Lessee must provide USFWS with a courtesy copy of the final Lighting Marking and Signaling Plan and the Lessee's approved application to USCG to establish Private Aids to Navigation (PATON). Notes: Measures to minimize lighting impacts on avian species during assessment construction and operations in the NY Bight should be implemented where feasible as approved by FAA BOEM USCG and other regulatory agencies. • Lighting-related impacts on coastal habitats and fauna should be minimized using Best Management Practices (BMPs) such as minimizing onshore facility lighting at night using down-shielded light fixtures aiming light upward and utilizing the longest permissible off cycles.	Refer to response to comment BOEM-2024-0001-0450-0016.

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	• Red flashing FAA-approved lights and yellow flashing marine navigation lights should be used on wind turbine generators (WTGs) instead of constant white lights to reduce bird attraction. • The NY Bight PEIS should extend the minimal lighting intensity approach to include vessels wind turbine generators and electric service platforms wherever possible to reduce potential bird attraction. • Research and monitoring are needed to measure distances at which phototaxis operates in seabirds especially the susceptible procellariiforms as this phenomenon greatly increases the potential for adverse impacts including higher collision risk. • Neither the avian risk assessment nor avian monitoring framework in the NY Bight PEIS adequately address the potential impact of turbine-associated phototaxis.	
BOEM-2024-0001-0439-0040	Measure ID: BIR-3 Measure Name: Compensatory Mitigation Plan for Piping Plover and Red Knot Description: At least 180 days prior to the start of commissioning of the first WTG the Lessee must distribute a Compensatory Mitigation Plan to BOEM BSEE and USFWS for review and comment. BOEM BSEE and USFWS will review the Compensatory Mitigation Plan and provide any comments on the plan to the Lessee within 60 days of its submittal. The Lessee must resolve all comments on the Compensatory Mitigation Plan to BOEM and BSEE's satisfaction before implementing the plan and before commissioning of the first WTG. The Compensatory Mitigation Plan must provide compensatory mitigation actions to offset take of piping plover and red knot by the fifth year of WTG operation. The Compensatory Mitigation Plan must include: (a) detailed description of the mitigation actions including mitigation mechanisms (e.g. mitigation agreement applicant-proposed mitigation) (b) the specific location for each mitigation action (c) a timeline for completion of the mitigation measures (d) itemized costs for implementing the mitigation actions and (e) monitoring to ensure the effectiveness of the mitigation actions in offsetting take. Previously Applied as a COP T&C: Check ACP Comment: Guidance and clarification is needed on compensatory mitigation actions for offsetting take in 5 years.	BOEM is continually reviewing this requirement. Guidance and clarification on BIR-3 in the context of a proposed project in the NY Bight lease areas can be provided at the project-specific COP NEPA review, including consideration of a post-implementation study.

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	Compensatory mitigation should only be implemented after assessment of what the actual impacts are based on study.	
BOEM-2024-0001-0446-0009-d	AMMM measure BIR-3 Compensatory Mitigation for Piping Plover and Red Knot requires monitoring [Bold: to ensure the effectiveness of the mitigation actions] in offsetting take relative to Piping Plover and Red Knot. The type of hypothesis-driven monitoring in BB-3 and BIR-3 is intended to advance broader fundamental knowledge of phenomena being examined together with providing answers to specific questions needed for management decisions. See 2022-2023 Studies Development Plan at 4 [[Footnote 8: https://www.boem.gov/sites/default/files/documents/environment/environmental- studies/SDP_2022-2023.pdf] But all of the goals stated in BB-3 are not carried over to BIR-3 and the collective goals of both BB-3 and BIR-3 (advance understanding improve estimates inform efforts to minimize ensure effectiveness of mitigation) are not similarly found in any of the other monitoring requirements listed in Appendix G.	Thank you for the comment. BOEM will take this into consideration.
BOEM-2024-0001-0450-0017	E. BIR-3 Compensatory Mitigation for Piping Plover and Red Knot We are pleased to see requirements to offset any take of the ESA-listed Piping Plover and Red Knot no later than the fifth year of operations in the NY Bight. [Footnote 67: BOEM 2024 p. G-6.] Moreover we support requirements that an accompanying Compensatory Mitigation Plan include: detailed description of the mitigation actions and mechanisms specific location for each mitigation action a timeline for completing such mitigation measures itemized costs for implementing the mitigation actions and monitoring protocols sufficient to ensure effectiveness of mitigation actions to offset take. [Footnote 68: Id.] Because policy and technical aspects of compensatory mitigation are evolving so rapidly we urge BOEM and industry to adopt the most recent recommendations and guidance established for best management practices in this still-emergent field especially in marine settings. [Footnote 69: Croll DA Ellis AA Adams J Cook AS Garthe S Goodale MW Hall CS Hazen E Keitt BS Kelsey EC Leirness JB. 2022. Framework for assessing and mitigating the impacts of offshore wind energy development on marine birds. Biological Conservation 276:109795.] As a general principle we strongly urge compensatory mitigation (whether required or	Thank you for the comment. BOEM will take this into consideration. Details regarding the Compensatory Mitigation Plan are project specific and would be determined at the project-specific COP NEPA consultations stage, as appropriate.

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	voluntary) for bird species that are not imperiled but that may experience high rates of displacement or collision.	
BOEM-2024-0001-0450-0083	Measure ID and Name: BIR-3 Compensatory Mitigation for Piping Plover and Red Knot Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): At least 180 days prior to the start of commissioning of the first WTG the Lessee must distribute a Compensatory Mitigation Plan to BOEM BSEE and USFWS for review and comment. BOEM BSEE and USFWS will review the Compensatory Mitigation Plan and provide any comments on the plan to the Lessee within 60 days of its submittal. The Lessee must resolve all comments on the Compensatory Mitigation Plan to BOEM and BSEE's satisfaction before implementing the plan and before commissioning of the first WTG. The Compensatory Mitigation Plan must provide compensatory mitigation actions to offset take of piping plover and red knot by the fifth year of WTG operation. The Compensatory Mitigation Plan must include:(a) detailed description of the mitigation actions including mitigation mechanisms (e.g. mitigation agreement applicant-proposed mitigation) (b) the specific location for each mitigation action (c) a timeline for completion of the mitigation measures(d) itemized costs for implementing the mitigation actions and (e) monitoring to ensure the effectiveness of the mitigation actions in offsetting take. Notes: • Requirements to offset any take of the ESA-listed Piping Plover and Red Knot by the fifth year of operations in the NY Bight are commendable. • Supporting requirements for an accompanying Compensatory Mitigation Plan including detailed mitigation actions specific locations timelines costs and monitoring protocols to ensure effectiveness. • Urging BOEM and industry to adopt the most recent recommendations and guidance for best management practices in compensatory mitigation especially in marine settings due to rapid policy and technical evolution in this field.	Thank you for the comment. BOEM will take this into consideration. Details regarding the Compensatory Mitigation Plan are project specific and would be determined at the project-specific COP NEPA consultations stage, as appropriate.

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	• Strongly advocating for compensatory mitigation whether required or voluntary for bird species not imperiled but at risk of displacement or collision.	
BOEM-2024-0001-0450-0018	F. MUL-5 Low Noise Best Practices. The NY Bight PEIS for offshore marine birds can be informed by several different avian mapping data products e.g. the Marine-life Data and Analysis Team (MDAT) marine bird relative density and distribution models [Footnote 70: Curtice C Cleary J Shumchenia E Halpin PN. 2019. Marine-life Data and Analysis Team (MDAT) technical report on the methods and development of marine-life data to support regional ocean planning and management. Prepared on behalf of the Marine-life Data and Analysis Team (MDAT).] the Northwest Atlantic Seabird Catalog the Manomet Bird Observatory (MBO) Seabird and Cetacean Assessment Program (CSAP) database [Footnote 71: Menza C Kinland BP Dorfman DS Poti M Caldow C (eds.). 2012. A Biogeographic Assessment of Seabirds Deep Sea Corals and Ocean Habitats of the New York Bight: Science to Support Offshore Spatial Planning. NOAA Technical Memorandum NOS NCCOS 141. Silver Spring MD. 224 pp.] and incidental records from eBird among various other sources. In combination these data reveal that the NY Bight and adjacent wind energy lease areas host a diverse assemblage of diving marine birds including sea ducks alcids and loons some or all of which occur primarily during the fall winter or spring months. Although sound mitigation measures during offshore wind activities are usually aimed at impacts on marine mammals sea turtles fishes and invertebrates the underwater hearing abilities for diving bird taxa are found to possess hearing thresholds in the frequency band 14 kHz (comparable to seals and toothed whales). [Footnote 72: Hansen KA Maxwell A Siebert U Larsen ON Wahlberg M. 2017. Great cormorants (Phalacrocorax carbo) can detect auditory cues while diving. Science of Nature 104:17; McGrew KA Crowell SE Fiely JL Berlin AM Olsen GH James J Hopkins H Williams CK. 2022. Underwater hearing in sea ducks with applications for reducing gillnet bycatch through acoustic deterrence. Journal of Experimental Biology 225:jeb243953.] Diving marine birds foraging <100 km away from seismic operations change their foraging direction during	MUL-5 is now considered an RP in the PEIS. Underwater noise impacts are addressed in the PEIS; the project-specific COP NEPA review would revisit all potential impacts for resources and may consider other AMMM measures that are not part of this PEIS.

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	acoustic disturbances and increase the distance between their feeding areas and the sound source. [Footnote 73: Pichegru L Nyengera R McInnes AM Pistorius P. 2017. Avoidance of seismic survey activities by penguins. Scientific Reports 7:18.] Indeed avoidance distances by diving seabirds to sounds generated from anthropogenic activities manifest at spatial scales up to tens of kilometers very similar to displacement distances reported in cetaceans during seismic surveys. [Footnote 74: Gordon J Gillespie D Potter J Frantzis A Simmonds MP Swift R Thompson D. 2003. A review of the effects of seismic surveys on marine mammals. Marine Technology Society Journal 37:1634.]The existing monitoring framework for the NY Bight PEIS ignores potential adverse injuries from acoustic disturbances to diving birds that might arise from project construction and/or operations. [Footnote 75: Monitoring and mitigation for diving birds is nowhere mentioned in conjunction with underwater acoustic disturbances during project construction activities in the NY Bight PEIS e.g. BOEM 2024 p. G-13.] We refer to lethal or sublethal injury from underwater sound pressure waves caused by high intensity acoustic pulses not to avoidance or temporary displacements that arise solely from avian changes in behavior. Because seabird taxa sensitive to this impact are more prevalent during winter minimization activities like seasonal curtailment may be justified to abate harm. Capable of diving to 140 m depths [Footnote 76: Wanless S Harris JA Morris MP. 1988. Diving behaviour of guillemot Uria aalge puffin Fratercula arctica and razorbill Alca torda as shown by radio-telemetry. Journal of the Zoological Society of London 216:7381.] Razorbills especially are known to flush readily from loud noises [Footnote 77: Lavers J Hipfner JM Chapdelaine G. 2020. Razorbill (Alca torda). In: Birds of the World v.2. Billerman SM (ed) Cornell Lab of Ornithology Ithaca NY USA. https://doi.org/10.2173/bow.razorb.01] they can occur during winter in the waters of the NY Bight region [Footnote 78: Williams KA Stenhouse IJ Adams EM Connelly EE Gilbert AT Duron M. 2015. Integrating novel and historical survey methods: a comparison of standardized boat-based and digital video aerial surveys for marine wildlife in the United States chapter 12 p. 7. https://briwildlife.org/wp-content/uploads/2021/08/MABS-Project-	

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	Chapter-13-Williams-et-al-2015.pdf] and like other alcids they are vulnerable to both displacement and macro- avoidance. [Footnote 79: Robinson Willmott JC Forcey G Kent A. 2013. The Relative Vulnerability of Migratory Bird Species to Offshore Wind Energy Projects on the Atlantic Outer Continental Shelf: An Assessment Method and Database. Final Report to the U.S. Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs. OCS Study BOEM 2013-207. 275 pp.] Densities of diving birds peak during winter on inner and middle shelf habitats [Footnote 80: Figure 42 in Robinson Willmott J Forcey G Vukovich M McGovern S Clerc J Carter J. 2020. Ecological Baseline Studies of the US Outer Continental Shelf: Final Report. Gainesville FL. OCS Study BOEM 2021079 p. 39.] at least in this portion of the Atlantic OCS. Thus seasonal shifting of noisy operations may eliminate acoustic risks to diving birds. Other methods for sound abatement include: (1) establishing safety zones monitored by visual observers [Footnote 81: E.g. the scope of responsibilities for Protected Species Observers (PSOs) could be extended to cover marine birds. PSOs are already required in adjacent projects; see for example Ocean Wind 1 Offshore Wind Farm. 2023. Final Environmental Impact Statement Appendix H Mitigation and Monitoring pp. H-6 H-12.] or passive acoustics and that trigger shut-down or low-power operations if large diving marine bird flocks enter these zones (2) using noise reduction gear like bubble curtains around pile driving and (3) deploying other noise-source modifications or changes to operational parameters such as soft starts. [Footnote 82: Erbe C Dunlop R Dolman S. 2018. Effects of noise on marine mammals. Pp. 277309 in Effects of anthropogenic noise on animals. Springer New York NY.]	

Table P.5.23-14. Responses to Substantive Comments on Mitigation and Monitoring—Marine Mammals, Sea Turtles, Finfish, Invertebrates, and EFH (MM, ST, MMST, STF)

Comment No.	Comment	Response
BOEM-2024-0001-0450-0027	Section I. Vessel strike mitigation recommendations during all stages of offshore wind development1) Require mandatory vessel speed restrictions: a) All project-associated vessels must adhere to a 10-knot speed restriction at all times except for reasons of safety. b) When traveling in any area where one or more regulations establish a speed restriction either seasonally or dynamically all project-associated vessels must adhere to the most stringent (i.e. the lowest speed) regulation applicable to that area. Vessels must also comply with all applicable speed restrictions established by permit. c) All project-associated vessels must slow to 4 knots except for reasons of safety while transiting through areas of visible jellyfish aggregations or floating vegetation lines or mats to improve protection for sea turtles.	Thank you for your comment. MM-5 requires all offshore wind-related vessels transiting between the O&M facility and the lease area to travel at or below 10 knots (18.5 kilometers per hour) during a Seasonal Management Area period, unless a Marine Mammal Vessel Strike Management Plan is submitted to BOEM, BSEE, and NMFS at least 180 days prior to the plan's implementation.
BOEM-2024-0001-0450-0028	2) Future alternative for vessel strike risk reduction: a) A 10-knot speed restriction is currently the only proven method for reducing the risk of lethal vessel strike of large whales. However the development of near real-time monitoring technologies for North Atlantic right whales and potentially other species of large whales may provide alternative tools for mitigating vessel strike risk in the future. When the best available science demonstrates that vessel strike avoidance methods can provide comparable or greater vessel strike risk reduction than a 10-knot speed restriction project proponents may develop an "Adaptive Plan" that modifies the 10-knot speed restriction. A determination that vessel strike avoidance methods can provide comparable or greater vessel strike risk reduction than a 10- knot speed restriction should be informed by the effectiveness criteria being developed by the joint Regional Wildlife Science Collaborative for Offshore Wind (RWSC) and Marine Technology Society Technology Workshop Series. [Footnote 17: RWSC "Technology Workshops" https://rwsc.org/technology-workshops/. This series is being funded by the Department of Energy with contributions from NOAA and BOEM.] Any Adaptive Plan must	Thank you for your comment. The vessel strike mitigation measure for marine mammals and sea turtles (MMST-14) details conditions for vessel transits associated with the projects, including speed restrictions. MM-5 requires all offshore wind-related vessels transiting between the O&M facility and the lease area to travel at or below 10 knots (18.5 kilometers per hour) during a Seasonal Management Area period, unless a Marine Mammal Vessel Strike Management Plan is submitted to BOEM, BSEE, and NMFS at least 180 days prior to the plan's implementation. Additionally, a new RP was developed (MM-8; effectiveness criteria for vessel strike avoidance plans) that states lessees should include in their vessel strike avoidance plans effectiveness criteria being applied. The joint RWSC and Marine Technology Society Technology Workshop Series may be a good resource for such effectiveness criteria. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. These RPs are not part of the Proposed Action.

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	be developed in consultation with the National Ocean and Atmospheric Administration (NOAA) Fisheries.	
BOEM-2024-0001-0450-0029	3) Implement other vessel-related measures: a) Any designated crew lookouts must receive training on protected species identification including distinguishing between large whale species and observing for the presence of small cetaceans manatees and sea turtles; vessel strike minimization procedures; how and when to communicate with the vessel captain; and reporting requirements. b) All vessel crew members must be briefed on the identification of marine mammal and sea turtle species. c) Vessels should maintain a separation distance of 500 meters (m) from North Atlantic right whales and other large whale species. i) Any time a large whale is within 200 m of an underway vessel or the vessel encounters a feeding aggregation of large whales a full stop is required if safety permits. ii) The vessel should remain stationary until large whales have moved at least 200 m away from the vessel after which point the separation distance should again be maintained. d) Vessels should maintain a separation distance of 50 m from all other marine mammal species and from sea turtles. e) Vessels in transit must post at least one trained lookout or Protected Species Observer (PSO) [Footnote 18: Protected Species Observers are trained professionals who monitor for protected species so that the possibility of vessel strikes is minimized and to prevent or shut down any sound sources or other development activity causing harassment if protected species are detected within a certain distance. For the purposes of the recommendations set out in this document lessees operators and developers should use trained independent third-party Protected Species Observers (e.g. not construction personnel) that are approved by NOAA Fisheries. Protected Species Observers should have no duties other than to effectively implement mitigation and monitoring measures during site assessment construction and/or operations.] to search for marine mammals and sea turtles and notify the captain upon visual detection.[Footnote 19: Additional PSO requirements for vessels conducting site assessment and construction activities are provided	AMMM measures MMST-14, MMST-7, and MMST-9 cover various aspects of vessel strike mitigation for marine mammals and sea turtles, PSO coverage, and training requirements.

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	in Section II(5)(b) (site assessment and characterization activities) Section III(8)(b) (pile-driving activities) and Section IV(3)(b) (installation of quiet foundations).] i) If the trained lookout is a vessel crew member this must be their designated role and primary responsibility while the vessel is transiting. ii) If a whale is observed that may be a North Atlantic right whale but its species cannot be confirmed the vessel operator must assume that it is a North Atlantic right whale and take appropriate action for avoidance or stoppage. f) All vessels responsible for crew transport should use thermal detection systems to supplement visual monitoring of marine mammals during transit with at least one additional trained crew lookout or PSO monitoring the thermal detection system at all times. g) All vessels (developer- and contractor-operated) must maintain a functioning Automatic Identification System (AIS) onboard and operate this system at all times.	
BOEM-2024-0001-0450-0030	4) Additional vessel-related measures for the North Atlantic right whale: a) Develop and implement the project's schedule to reduce vessel density during the times of year when North Atlantic right whales are most likely to occur in lease areas and along vessel routes. Coordinate across different offshore wind development projects to reduce cumulative vessel density within the region to the extent practicable. i) Time periods of highest risk include but are not limited to during foraging and migration and times when mother-calf pairs pregnant females surface active groups (indicative of breeding or social behavior) or aggregations of three or more whales (indicative of feeding or social behavior) are or are expected to be present. Time periods should be defined based on the best available scientific information.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs. MM-7 states that lessees are encouraged to develop and implement the project’s schedule to reduce vessel density during the times of year when NARWs are most likely to occur in lease areas and along vessel routes. Lessees are encouraged to coordinate across different offshore wind development projects to reduce cumulative vessel density within the region to the extent practicable.
BOEM-2024-0001-0439-0052	Measure ID: MM-5 Measure Name: NARW Strike Management Plan Description: All offshore wind-related vessels will travel at 10 knots (18.5 kilometers per hour) or less while transiting to and from U.S. ports to lease areas and while operating within lease areas unless a NARW Strike Management Plan is submitted to BOEM BSEE and	AMMM measure MM-5 has been reviewed by BOEM and updated. MM-5 requires all offshore wind-related vessels transiting between the O&M facility and the lease area to travel at or below 10 knots (18.5 kilometers per hour) during a Seasonal Management Area period, unless a Marine Mammal Vessel Strike

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	NMFS prior to the Plan's implementation. The plan must provide details on how the required vessel and/or aerial-based surveys and PAM and/or other detection methodologies will be conducted to clear the vessel routes of NARW presence. The plan must also provide details on the vessel-based observer protocol on transiting vessels as well as any further efforts to minimize potential impacts. BOEM and BSEE will review the NARW Strike Management Plan and provide comments if any on the plan. The Lessee must resolve all comments on the NARW Strike Management Plan to BOEM and BSEE's satisfaction prior to implementing the plan. Category: D G B T/EACP Comment: NOAA NMFS has an ongoing rulemaking process (Proposed Amendment to the North Atlantic Right Whale Vessel Strike Reduction Rule) that would greatly expand the size and duration of 10-knot vessel speed requirements and expand the size of vessels for which it is applicable to. By applying this measure BOEM would be circumventing the active rulemaking process. Therefore BOEM should remove this measure. ACP provided detailed comments on the proposed rule[Footnote 8: htps://www.regulations.gov/comment/NOAA-NMFS-2022-0022-21043] which among other comments provides alternatives to a one size fits all speed rule which can be applied here. How does this mitigation measure reduce impacts when this measure only applies to offshore wind vessels which comprise only 2% of vessel traffic? 98% of vessels are not held to any speed restrictions. In fact offshore wind vessels conduct visual monitoring during vessel transits which the other 98% of vessels do not do. Therefore the application of this mitigation measure when put into the context of past present and reasonably foreseeable activities would have a negligible difference in impacts. Mitigation measures should only be imposed if they can demonstrate a true reduction in impacts. Although there is no measurable reduction in impacts from the application of this measure it puts a significant burden on industry. Applying the 10-knot speed restriction year-round to all vessels regardless of length impedes the offshore wind industry ability to construct projects. This measure is not feasible reasonable or practical and if it was a year-round 10-knot vessel speed requirement for all vessels would be part of the vessel speed rule. In addition this measure conflicts with	Management Plan is submitted to BOEM, BSEE, and NMFS at least 180 days before the plan's implementation. Additionally, reference to the NMFS Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, has been added.

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	MMST-13 which details a seasonal speed measure. This measure also means more time on the water and longer construction timeframes which increases health and safety risks to workers and exposure to marine mammals. In addition aerial surveys are expensive and are dangerous (leading cause of observer death in the field). If BOEM is to impose a 10-knot speed restriction it should only apply to vessels greater than 65 feet. Visual clearance from the vessel should be added to the potential methodologies for clearing routes of NARW presence. Other plans submitted for offshore wind projects have exceeded 14 rounds of comment review and time limits for plan approval must be incorporated. Finally this measure overlaps with many other plans/AMMMs. This plan contains elements of other plans and is simply being called out on its own. The measure is not well linked to other highly related measures such as dedicated watch standards situational awareness network tools vessel speed constraints measures to avoid sighted animals and the real time PAM requirements. BOEM should overhaul their approach to this topic as it is adding burden and confusion to both the agencies and developers with multiple individual plans and conditions that are inherently connected and in some cases duplicative or contradicting. The issue remains that offshore wind is carrying the financial burden of what is a maritime industry issue. It would be more acceptable if the federal government/USCG developed a requirement for all vessels to participate in a situational awareness network managed by the USCG with financial support spread across all maritime vessels. (in Puget Sound the USCG has started a 24/7 Whale Desk for this purpose).We recommend that all vessel strike related measures be condensed into one Vessel Strike Avoidance plan which allows for adaptability and optionality that includes flexibility in speed constraints. That plan should be tightly linked to the vessel speed rule and should not conflict with or exceed those requirements. Sea turtle and other larger whale measures should be included in this.	
BOEM-2024-0001-0450-0060	Measure ID and Name:MM-5: [Strikethrough: NARW Strike Management Plan] [Underline: Vessel speed requirements] Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): “All offshore wind-related vessels will travel at 10 knots (18.5 kilometers per hour) or	AMMM measure MM-5 has been reviewed by BOEM and updated. MM-5 requires all offshore wind-related vessels transiting between the O&M facility and the lease area to travel at or below 10 knots (18.5 kilometers per hour) during a Seasonal Management Area period, unless a Marine Mammal Vessel Strike

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	less while transiting to and from U.S. ports to lease areas, and while operating within lease areas, except for reasons of safety. When traveling in an area where one or more regulations establish a speed restriction, all project-associated vessels must adhere to the most stringent (i.e. the lowest speed) regulation applicable to that area. [Underline: A 10-knot speed restriction is currently the only proven method for reducing the risk of lethal vessel strike of large whales. However, the development of near real-time monitoring technologies for North Atlantic right whales, and potentially other species of large whales, may provide alternative tools for mitigating vessel strike risk in the future. When the best available science demonstrates that vessel strike avoidance methods can provide comparable or greater vessel strike risk reduction than a 10-knot speed restriction,1 project proponents may develop an "Adaptive Plan" that modifies the 10-knot speed restriction. Any such Adaptive Plan must be developed in consultation with the National Ocean and Atmospheric Administration (NOAA) Fisheries.] [Strikethrough:, unless a NARW Strike Management Plan is submitted to BOEM, BSEE and NMFS prior to the Plan's implementation. The plan must also provide details on the vessel-based observer protocol on transiting vessels as well as any further efforts to minimize potential impacts. BOEM and BSEE will review the NARW Strike Management Plan and provide comments if any on the plan. The Lessee must resolve all comments on the NARW Strike Management Plan to BOEM and BSEE's satisfaction prior to implementing the plan."] Notes: We support the 10-knot speed restriction for all offshore wind-related vessels provided by MM-5.We recommend that BOEM disallow vessels from using monitoring or vessel strike avoidance measures (i.e. an "Adaptive Plan") in lieu of a 10-knot vessel speed restriction until best available science demonstrates that monitoring methods are indeed capable of providing equal or greater protection to NARW than a 10-knot speed restriction. This determination should be informed by the effectiveness criteria being developed by the joint Regional Wildlife Science Collaborane Technology Society Technology (https://rwsc.org/technology-workshops/).	Management Plan is submitted to BOEM, BSEE, and NMFS at least 180 days prior to the plan's implementation. Additionally, reference to the NMFS Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, has been added. A new RP was developed (MM-8; effectiveness criteria for vessel strike avoidance plans) that states lessees should include in their vessel strike avoidance plans effectiveness criteria being applied. The joint RWSC and Marine Technology Society Technology Workshop Series may be a good resource for such effectiveness criteria. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. RPs are not part of the Proposed Action.

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BOEM-2024-0001-0450-0021	A. MM-5 NARW Strike Management Plan and MMST-5 PSO Coverage of Expanded Clearance/Shutdown Zones1. Vessel strike risk reduction measures are insufficient As BOEM is well aware vessel collisions are one of the leading causes of large whale injury and mortality particularly for North Atlantic right whales and are a primary driver of multiple Unusual Mortality Events currently designated for other large whales. Furthermore current research shows that a collision between a whale and a vessel of any length traveling above a speed of 10 knots is highly likely to result in a lethal strike. [Footnote 93: Jessica V. Redfern et al. Estimating reductions in the risk of vessels striking whales achieved by management strategies BIOLOGICAL CONSERVATION 290: 110427 (2024); Dan E. Kelley et al. Assessing the lethality of ship strikes on whales using simple biophysical models MARINE MAMMAL SCI. 37: 25167 (2021).] This risk is likely higher for calves and juveniles. In the Draft PEIS BOEM proposes to require all offshore wind-related vessels to reduce vessel speed to 10 knots or less while transiting to and from U.S. ports to lease areas and while operating within lease areas unless a "NARW Strike Management Plan" is submitted to BOEM the Bureau of Safety and Environmental Enforcement (BSEE) and National Marine Fisheries Service (NMFS) prior to the Plan's implementation (MMST-5). The NARW Strike Management Plan is a required package of measures that aims to reduce vessel strikes which may include a 10-knot speed limit as well as other risk reduction measures such as the deployment of Protected Species Observers (PSOs) and is reviewed and approved by BOEM prior to its implementation. Additionally BOEM proposes to require all offshore wind-related vessels to travel at 10 knots or less when transiting to and from or within the wind development area from November 1st through May 14th [Footnote 94: We note that the November 1st to May 14th timeframe is inconsistent with the period when the Seasonal Speed Zone for the Atlantic described in the proposed amendments to the North Atlantic right whale vessel speed rule would be in effect (November 1st to May 30th). 87 Fed. Reg. 46921 (Aug. 1 2022).] with the exception of crew transfer vessels. BOEM will allow crew transfer vessels to travel at speeds in excess of 10 knots if there is at least one visual observer on duty at all times	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. MMST-13 has been removed, as it is covered in MMST-14. MMST-14 has been updated to include Seasonal Management Areas and Dynamic Management Areas to cover when vessels are in the area. Additionally, in MM-5, reference to the NMFS Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, has been added.

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	aboard the vessel to visually monitor for large whales and real time passive acoustic monitoring (PAM) is conducted. If a North Atlantic right whale is detected via visual observation or PAM within or approaching the transit route all crew transfer vessels must travel at 10 knots or less for the remainder of the day (MMST-13). When the requirements are considered collectively it can be concluded that the NARW Strike Management Plan under MMST-5 can only be used outside of the specific high risk dates of November 1st through May 14th and that crew transfer vessels are the only vessel type that may exceed a vessel speed limit of 10 knots between May 15th and October 31st if the required visual and acoustic monitoring measures are in effect. The vessel strike risk reduction measures proposed in the Draft PEIS are insufficient and we strongly disagree with BOEM's determination that vessel traffic impacts to North Atlantic right whales can be recategorized from "major" to "negligible" based on the AMMM Measures included in Alternative-C. [Footnote 95: DPEIS 3.5.6-90.] The vulnerability of North Atlantic right whales to vessel strikes the fact the species cannot withstand a single mortality per year if it is to ever recover and that individual whales may now be found virtually anywhere off the U.S. East Coast at any time of year due to climate-change driven shifts in their distribution means that vessel strike risk to North Atlantic right whales posed by the offshore wind industry must practically be eliminated. We remind BOEM that rather than being "known and highly effective" [Footnote 96: Id.] many of the AMMM measures proposed to reduce vessel strike risk to North Atlantic right whales are as yet unproven in reducing strike risk from offshore wind-associated vessels. North Atlantic right whales regularly occupy habitat outside of regulatory seasonal 10-knot slowdown areas and are at high risk apart from in the few instances where they are sighted and reported or detected acoustically and NOAA triggers a Dynamic Management Area or Slow Zone. While we agree that the AMMM Measures proposed will help to reduce vessel strike risk to North Atlantic right whales they are insufficient in entirely preventing the risk of a single lethal vessel strike to an individual whale even from a single offshore wind project. As such the risk of vessel traffic to North Atlantic right whales should be retained as "Major" in Alternative-C. Further BOEM	

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	must also address potential impacts to other protected large whale species and should pursue vessel strike reduction measures protective of all large whale species found in the New York Bight. Humpback whales in particular have been experiencing an Unusual Mortality Event since 2016 and vessel strikes have been determined to be one of the contributing factors. [Footnote 97:NOAA Fisheries. 2016-2024 Humpback Whale Unusual Mortality Event Along the Atlantic Coast. https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2024-humpback-whale-unusual-mortality-event-along-atlantic-coast.] Human-caused mortality of the humpback whale population that inhabits the New York Bight has now exceeded the potential biological removal level for the stock [Footnote 98:The potential biological removal (PBR) level is an estimate of the number of individuals that could be taken as a result of human activities while still allowing the stock to recover to or remain within the envelope of its optimum sustainable population size. The most recent PBR estimate for the Gulf of Maine stock of humpback whales is 22 and the number of human- caused mortalities documented in 2023 was 37. See NOAA Fisheries. 2016-2024 Humpback Whale Unusual Mortality Event Along the Atlantic Coast supra; and the April 2020 NOAA Fisheries Marine Mammal Stock Assessment for the Gulf of Maine Stock of humpback whales. https://s3.amazonaws.com/media.fisheries.noaa.gov/2020-10/2019%20humpback%20whale%20gulf%20of%20Maine%20508.pdf?null.] putting in question their continued recovery. To improve vessel strike risk reduction for North Atlantic right whales and other large whales in the New York Bight BOEM should require that all project-associated vessels adhere to a 10-knot speed restriction at all times except for reasons of safety. When traveling in an area where one or more regulations establish a speed restriction all project-associated vessels must adhere to the most stringent (i.e. the lowest speed) regulation applicable to that area. For proposed changes to measures MM-5 and MMST- 13 see Attachment 2 table 1.A 10-knot speed restriction is currently the only proven method for reducing the risk of lethal vessel strike of large whales. However the development of near real-time monitoring technologies for North Atlantic right whales and potentially other species of large whales	

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	may provide alternative tools for mitigating vessel strike risk in the future. When the best available science demonstrates that vessel strike avoidance methods can provide comparable or greater vessel strike risk reduction than a 10-knot speed restriction BOEM may allow project proponents to develop an "Adaptive Plan" that modifies the 10-knot speed restriction. Any such Adaptive Plan must be developed in consultation with NOAA Fisheries. We recommend that the determination of the equivalency of a vessel strike avoidance measure with a 10-knot vessel speed limit be informed by the effectiveness criteria being developed by the joint Regional Wildlife Science Collaborative for Offshore Wind (RWSC) and Marine Technology Society Technology Workshop Series funded by the Department of Energy with contributions from NOAA and BOEM. [Footnote 99: https://rwsc.org/technology-workshops/.] For proposed changes to measure MUL-5 see Attachment 2 table 1.	
BOEM-2024-0001-0439-0053	Measure ID: MMST-1 Measure Name: Alternative Monitoring Plan Description: The Lessees must submit a single Alternative Monitoring Plan containing two parts: (1) Low-Visibility Pile-Driving Monitoring and (2) Nighttime Pile-Driving Monitoring for review by NMFS BSEE and BOEM prior to initiating foundation pile-driving activities. The purpose of this plan is to demonstrate that the Lessees can meet the visual monitoring criteria for the Level A harassment zone(s)/mitigation and monitoring zones plus an agreed-upon buffer zone (these combined zones are referred to henceforth as the nighttime and low-visibility clearance and shutdown zones). Both parts will demonstrate effective use of technologies that the Lessee is proposing to use for monitoring during nighttime and low-visibility conditions for instances during daylight hours when lighting or weather (e.g. fog rain sea state) prevent visual monitoring of the full extent of the clearance and shutdown zones. "Daytime" is defined as 1 hour after civil sunrise to 1.5 hours before civil sunset. The Alternative Monitoring Plan must also include measures for deploying additional observers or using PAM with the goal of ensuring the ability to maintain all clearance and shutdown zones in the event of unexpected poor visibility conditions. BOEM and BSEE will review the Alternative Monitoring Plan and provide comments if any on the plan. The Lessee must resolve all comments on the	Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures. MMST-1 has been revised and renamed to Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan. Additional clarity has been provided in the measure, including that the lessee may submit one plan covering both reduced visibility and nighttime monitoring. Project-specific nighttime/low-visibility zones will be established on a project-by-project basis.

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	Alternative Monitoring Plan to BOEM and BSEE's satisfaction prior to implementing the plan.3. Low-Visibility Pile-Driving Monitoring: This part of the plan will need to identify the following components: identification of low-visibility monitoring devices (e.g. vessel-mounted thermal infrared [IR] camera systems handheld or wearable night vision devices [NVDs] handheld IR imagers) that would be used to detect marine mammal and sea turtle species relative to the established clearance and shutdown zones. The buffer zone distance and visual monitoring criteria will be developed by NMFS and BOEM at the project stage. The Low-Visibility Pile-Driving Monitoring part will be applicable during pile-driving activities conducted in poor or low-visibility conditions (i.e. instances where clearance and shutdown zones cannot be effectively monitored) hereafter termed low-visibility pile-driving. If during low-visibility pile-driving undetected animals are found in the clearance and/or shutdown zones low-visibility pile-driving activities must cease as soon as possible in consideration of human safety and applicable federal permitting agencies must be notified immediately. Low-visibility pile-driving must not restart until approval is provided by applicable federal permitting agencies unless visibility improves to normal conditions. Nighttime Pile-Driving Monitoring: This part of the plan must demonstrate the capability of the proposed monitoring methodology to detect marine mammals and sea turtles within the full extent of the established clearance and shutdown zones (i.e. species can be detected at the same distances and with similar confidence) with the same effectiveness as daytime visual monitoring (i.e. same detection probability). Only devices and methods demonstrated as being capable of detecting marine mammals and sea turtles to the maximum extent of the clearance and shutdown zones will be acceptable. This part of the plan will include the following components: identification of nighttime monitoring devices (e.g. vessel-mounted thermal IR camera systems handheld or wearable NVDs handheld IR imagers); the Lessee must discuss the efficacy (range and accuracy) of each device proposed for nighttime monitoring as demonstrated in field trials. The plan must include procedures and timeframes for notifying the applicable federal permitting agencies of the Lessee's intent to pursue	

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	nighttime foundation pile-driving and reporting procedures contacts and timeframes. The Nighttime Pile-Driving Monitoring part would be reviewed by both NMFS and BOEM. Factors for review will be developed by NMFS and BOEM at the project stage. If the Nighttime Pile-Driving Monitoring part of the plan is not accepted foundation pile-driving may commence only during daylight hours and no earlier than 1 hour after civil sunrise. Foundation pile-driving may not be initiated any later than 1.5 hours before civil sunset and may continue after dark only when the installation of that pile began during daylight hours and must proceed for human safety or installation feasibility reasons. If the Nighttime Pile-Driving Monitoring part of the plan is accepted in addition to foundation pile-driving commencing during daylight hours new piles may be initiated outside of the previously defined daylight hours (1 hour after civil sunrise to 1.5 hours before civil sunset) to meet schedule requirements. Category: B T/E DACP Comment: The condition is differentiating two different types of periods where visual monitoring could be constrained. BOEM should consult and agree with NMFS OPR on consistent naming of plans that both require. NMFS and BOEM need to provide the industry with clear guidelines and standards with regards to what the technology industry/developers need to provide/demonstrate to achieve "demonstrate effective use of technologies". Time limits for plan approvals must be incorporated. Visual monitoring for sea turtles during nighttime or low visibility is not practicable as the species is ectothermic and should not be included in this measure. The only known method is to illuminate the surrounding waters which will serve to attract marine species and birds/bats. NMFS does authorize mortality takes for sea turtles and this must be considered. The reference to sea turtles should be removed from this condition. In addition we recommend the following changes to the language within the measure: Requiring "full extent of the established clearance and shutdown zones" should be changed to "with the goal of monitoring the shutdown zones". In addition "with the same effectiveness as daytime visual monitoring" should be modified to state "with the goal of similar effectiveness as daytime visual monitoring." "Factors for review will be developed by NMFS and	

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	BOEM at the project stage": NMFS needs to provide clear and fair guidelines and standards that all developers and the tech industry can follow to demonstrate the effectiveness of alternative monitoring technologies. It's not feasible to wait until the "project stage" to determine the ability to pile at night. The measure states "..if during low-visibility pile-driving undetected animals are found in the clearance and/or shutdown zones..". This language is unclear -- if an animal is undetected how is it found? The measures states that "Low-visibility pile-driving must not restart until approval is provided by applicable federal permitting agencies unless visibility improves to normal conditions". This is not feasible and is why the PSOs are there. They make the determination that the zones are clear. This is inherently their job to do onsite. If this is a measure the activity will be constrained in a way never seen before for any project. Will there be a 24/7 line to reach applicable Federal permitting agencies? What happens on the weekends? Again this is the responsibility and authority of the PSOs to determine this and the agencies entrust them to implement the measures. PSOs regularly shut down and restart noise producing activities. NMFS and BOEM set the criteria and they implement. The language stipulates additional approvals before nighttime piling starts while understandable as a measure industry needs certainty of the time frame of those turn arounds. There should be 24/7 support and an established turnaround time for the approval so the opportunity given good nighttime conditions is not lost due to process delays.	
BOEM-2024-0001-0450-0061	Measure ID and Name: MMST-1: Alternative Monitoring Plan Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "The Lessees must submit a single Alternative Monitoring Plan containing two parts: (1) Low-Visibility Pile-Driving Monitoring and (2) Nighttime Pile-Driving Monitoring for review by NMFS BSEE and BOEM prior to initiating foundation pile-driving activities. The purpose of this plan is to demonstrate that the Lessees can meet the visual monitoring criteria for the Level A harassment zone(s)/mitigation and monitoring zones plus an agreed-upon buffer zone (these combined zones are referred to henceforth as the nighttime and low visibility clearance and shutdown zones). Both parts will demonstrate effective use of	Based on comments received on the Draft PEIS, BOEM has reviewed all AMMM measures. MMST-1 has been renamed to Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan for consistency. MM-2: Real-time PAM monitoring and alert system for baleen whales is an RP that encourages implementation of a near-real-time PAM system for the detection of baleen whales in the NY Bight during offshore wind development activities. In addition, another new RP (MM-8) was developed encouraging lessees to include in their vessel strike avoidance plans effectiveness criteria being applied.

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	technologies that the Lessee is proposing to use for monitoring during nighttime and low-visibility conditions for instances during daylight hours when lighting or weather (e.g. fog rain sea state) prevent visual monitoring of the full extent of the clearance and shutdown zones. "Daytime" is defined as 1 hour after civil sunrise to 1.5 hours before civil sunset. The Alternative Monitoring Plan must also include measures for deploying additional observers or using PAM with the goal of ensuring the ability to maintain all clearance and shutdown zones in the event of unexpected poor visibility conditions. BOEM and BSEE will review the Alternative Monitoring Plan and provide comments if any on the plan. The Lessee must resolve all comments on the Alternative Monitoring Plan to BOEM and BSEE's satisfaction prior to implementing the plan. 1. Low-Visibility Pile-Driving Monitoring: This part of the plan will need to identify the following components: identification of low visibility monitoring devices (e.g. vessel-mounted thermal infrared [IR] camera systems handheld or wearable night vision devices [NVDs] handheld IR imagers) that would be used to detect marine mammal and sea turtle species relative to the established clearance and shutdown zones. The buffer zone distance and visual monitoring criteria will be developed by NMFS and BOEM at the project stage. The Low-Visibility Pile-Driving Monitoring part will be applicable during pile-driving activities conducted in poor or low-visibility conditions (i.e. instances where clearance and shutdown zones cannot be effectively monitored) hereafter termed low-visibility pile-driving. If during low-visibility pile-driving undetected animals are found in the clearance and/or shutdown zones low-visibility pile-driving activities must cease as soon as possible in consideration of human safety and applicable federal permitting agencies must be notified immediately. Low-visibility pile-driving must not restart until approval is provided by applicable federal permitting agencies unless visibility improves to normal conditions.2. Nighttime Pile-Driving Monitoring: This part of the plan must demonstrate the capability of the proposed monitoring methodology to detect marine mammals and sea turtles within the full extent of the established clearance and shutdown zones (i.e. species can be detected at the same distances and with similar confidence) with the same effectiveness as daytime	BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. RPs are not part of the Proposed Action.

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	visual monitoring (i.e. same detection probability). Only devices and methods demonstrated as being capable of detecting marine mammals and sea turtles to the maximum extent of the clearance and shutdown zones will be acceptable. This part of the plan will include the following components: identification of nighttime monitoring devices (e.g. vessel-mounted thermal IR camera systems handheld or wearable NVDs handheld IR imagers); the Lessee must discuss the efficacy (range and accuracy) of each device proposed for nighttime monitoring as demonstrated in field trials. [Strikethrough: The plan must include procedures and timeframes for notifying the applicable federal permitting agencies of the Lessee's intent to pursue nighttime foundation pile-driving and reporting procedures contacts and timeframes. The Nighttime Pile-Driving Monitoring part would be reviewed by both NMFS and BOEM. Factors for review will be developed by NMFS and BOEM at the project stage. If the Nighttime Pile-Driving Monitoring part of the plan is not accepted] Foundation pile-driving may commence only during daylight hours during times of good visibility and no earlier than 1 hour after civil sunrise. Foundation pile-driving may not be initiated any later than 1.5 hours before civil sunset and may continue after dark only when the installation of that pile began during daylight hours and must proceed for human safety or installation feasibility reasons. [Strikethrough: If the Nighttime Pile Driving Monitoring part of the plan is accepted in addition to foundation pile-driving commencing during daylight hours new piles may be initiated outside of the previously defined daylight hours (1 hour after civil sunrise to 1.5 hours before civil sunset) to meet schedule requirements.] However the development of near real-time monitoring technologies may provide alternative monitoring tools to allow the commencement of pile-driving at night in the future. When the best available science demonstrates that nighttime monitoring tools are as effective as daytime monitoring in good visibility conditions at detecting marine mammals and sea turtles during pile-driving activities[Footnote 2 We recommend this determination be informed by the effectiveness criteria being developed by the joint Regional Wildlife Science Collaborative for Offshore Wind (RWSC) and Marine Technology Society Technology Workshop Series being funded by the	

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	Department of Energy with contributions from NOAA and BOEM. https://rwsc.org/technology-workshops/.] project proponents may develop an Alternative Monitoring Plan that allows pile-driving activities to commence at nighttime subject to approval by NMFS and BOEM. "Notes: We recommend that BOEM modify measure MMST-1 to disallow lessees from initiating pile-driving activities during periods of low visibility and at night under an Alternative Monitoring Plan. Presently alternative monitoring methods have insufficient capability to detect marine mammals and sea turtles during periods of low visibility and at night. We recommend that BOEM disallow initiation of pile-driving activities during periods of low visibility or at night until the best available science demonstrates that low visibility and nighttime monitoring tools are as effective as daytime monitoring in good visibility conditions at detecting marine mammals and sea turtles. This determination should be informed by the effectiveness criteria being developed by the joint Regional Wildlife Science Collaborane Technology Society Technology (https://rwsc.org/technology-workshops/).	
BOEM-2024-0001-0469-0021	AMMM measure MMST-12 outlines shutdown standards depending on the type of equipment and animal. Regarding sea turtles "there is no need to wait for the turtle to leave the pre-start clearance zone and no need to wait 30 minutes if not detected after the initial sighting before turning the source back on after a shutdown (i.e. it can be considered a brief "pause")". [Footnote 74: Id. at G-16.] This approach is too lax given that little research has been done on sea turtle hearing and population density surveys are lacking. [Footnote 75: NEW YORK BIGHT DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT supra note 5 appx. E.; L. Bennun et al supra note 42.] Moreover all the sea turtle species that frequent the New York Bight are endangered. [Footnote 76: See N.Y. STATE DEP'T ENV'T CONSERVATION Protecting and Conserving Marine Life https://dec.ny.gov/nature/waterbodies/oceans-estuaries/ocean-action-plan/protecting-conserving-marine-life (last visited Mar. 13 2024).] In order to prevent adverse acoustic impacts and/or vessel strike vessels should wait for a sea turtle to leave the pre-start clearance zone and wait thirty (30) minutes before resuming the use of acoustic equipment.	Based on comments received on the Draft PEIS, BOEM has reviewed all AMMM measures. The review resulted in many revisions, including MMST-12, which now includes sea turtles in the shutdown standards.

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BOEM-2024-0001-0439-0057	Measure ID:MMST- 13Measure Name: Vessel speed requirements November 1through May 14Description:From November 1 through May 14 all vessels must travel at 10 knots (18.5 kilometers per hour) or less when transiting to/from or within the wind development area with the exception of crew transfer vessels as described below. From November 1 through May 14 crew transfer vessels may travel at more than 10 knots (18.5 kilometers per hour) if there is at least one visual observer on duty at all times aboard the vessel to visually monitor for large whales and real-time PAM is conducted. If a NARW is detected via visual observation or PAM within or approaching the transit route all crew transfer vessels must travel at 10 knots (18.5 kilometers per hour) or less for the remainder of that day. Previously Applied as a COP T&C: Category: D G J BACP Comment: NOAA NMFS has an ongoing rulemaking process (Proposed Amendment to the North Atlantic Right Whale Vessel Strike Reduction Rule) that would greatly expand the size and duration of 10-knot vessel speed requirements and expand the size of vessels for which it is applicable to. By applying this measure BOEM would be circumventing the active rulemaking process and may end up with a requirement that conflicts with the final rule. The result would be one set of requirements for offshore wind and another set of requirements for every other vessel on the OCS. This measure also conflicts with MM-5. Therefore BOEM should remove this measure. ACP provided detailed comments on the proposed rule[Footnote 9: https://www.regula?ons.gov/comment/NOAA-NMFS-2022-0022-21043] which among other comments provide alternatives to a one size fits all speed rule.	Based on comments received on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included consolidating and removing redundant components of AMMM measures. MMST-13 has been removed, as it is covered in MMST-14. MMST-14 has been updated to include Seasonal Management Areas and Dynamic Management Areas to cover when vessels are in the area. MM-5 requires all offshore wind-related vessels transiting between the O&M facility and the lease area to travel at or below 10 knots (18.5 kilometers per hour) during a Seasonal Management Area period, unless a Marine Mammal Vessel Strike Management Plan is submitted to BOEM, BSEE, and NMFS at least 180 days prior to the plan's implementation. Additionally, in MM-5, reference to the NMFS Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, has been added.
BOEM-2024-0001-0450-0064	Measure ID and Name:MMST-13:Vessel speed requirements November 1through May 14 Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):"From November 1 through May 14 all vessels must travel at 10 knots (18.5 kilometers per hour) or less when transiting to/from or within the wind development area.[Strikethrough: with the exception of crew transfer vessels as described below. From November 1 through May 14 crew transfer vessels may travel at more than 10 knots (18.5 kilometers per hour) if there is at least one visual observer on duty at all times aboard the	Based on comments received on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions that included consolidating and removing redundant components of AMMM measures. MMST-13 has been removed, as it is covered in MMST-14. MMST-14 has been updated to include Seasonal Management Areas and Dynamic Management Areas to cover when vessels are in the area. MM-5 requires all offshore wind-related vessels transiting between the O&M facility and the lease area to travel at or below 10 knots (18.5 kilometers per hour) during a Seasonal Management Area period, unless a

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	vessel to visually monitor for large whales and real-time PAM is conducted. If a NARW is detected via visual observation or PAM within or approaching the transit route all crew transfer vessels must travel at 10 knots (18.5 kilometers per hour) or less for the remainder of that day."] Notes: We support the 10-knot speed restriction for all offshore wind-related vessels provided by MM-5 (see above).We recommend that BOEM apply a 10-knot speed restriction to all vessels during the full year including crew transfer vessels. Therefore we recommend that BOEM remove the exception from the 10-knot speed restriction for crew transfer vessels. Considering MMST-13 together with MM-5 we read MMST-13 to provide a range of dates (November 1 through May 14) during which project proponents may use alternative monitoring or vessel strike avoidance measures (as detected in the "NARW Strike Management Plan" in place of following the 10-knot speed limit provided in MM-5. As stated in the notes to MM-5 above we recommend that BOEM disallow the use of adaptive monitoring or vessel strike avoidance measures in lieu of a 10-knot vessel speed restriction until vessel strike avoidance methods can provide comparable or greater vessel strike risk reduction than a 10-knot speed restriction. However we support MMST-13's provision of dates during which NARW Strike Management Plans may not provide an exception to the 10-knot speed limit such as at times when one or more regulations establish a 10-knot (or lower) speed restriction.	Marine Mammal Vessel Strike Management Plan is submitted to BOEM, BSEE, and NMFS at least 180 days prior to the plan's implementation. Exceptions have been removed for crew transfer vessels. Additionally, in MM-5, reference to the NMFS Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, has been added.
BOEM-2024-0001-0450-0065	Measure ID and Name: MMST-14: Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "Vessel personnel must do the following to avoid causing injury or death to marine mammals and sea turtles: Vessel strike mitigation measures for marine mammals and sea turtles • Notify the vessel captain of any whale within 1640 feet (500 meters) of the vessel and immediately implement strike-avoidance procedures to maintain a separation distance of 1640 feet (500 meters) from all listed species of whales including changing vessel direction or reducing vessel speed to allow the animal to travel away from the vessel. Any time a listed whale is within 656 feet (200 meters) of an underway vessel a full stop is	BOEM has reviewed all AMMM measures, including MMST-14, which has been revised to state in part that a minimum separation distance of 500 meters or greater for marine mammals must be maintained around all surface vessels and that vessels must slow and avoid sea turtles within a separation distance of 100 meters. MMST-14 has been updated to clarify vessel strike mitigations for avoiding large whales. References to separation distances for small cetaceans have been removed from MMST-14. Language regarding a waiver has been removed.

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	required if safety permits. If a whale is observed but cannot be confirmed as a species other than a NARW the vessel operator must assume that it is a NARW and take appropriate action to avoid the animal. • When sea turtles [Underline: non-listed] [Strikethrough: small] cetaceans or seals are sighted attempt to maintain a minimum separation distance of [Underline: 328] [Strikethrough: 164] feet ([Underline: 100] [Strikethrough: 50] meters) [Underline: from sea turtles and small cetaceans and a separation distance of] 164 feet (50 meters) [Underline: from seals] to the maximum extent practicable with an exception made for those animals that approach the vessel[Strikethrough: The Lessee may file for consideration by a request for a waiver of any of these restrictions by submitting a vessel strike risk reduction plan that details revised measures along with an analysis to demonstrate that the measure(s) will provide a level of risk reduction at least equivalent to the measure(s) being proposed to be replaced. The plan must be provided at least 120 days prior to a request for approval and will not be implemented until approved."] Notes: We support MMST-14's requirement that vessels maintain a separation distance of 500 meters from all listed whale species and its requirement that operators should assume that whales are NARW if they cannot confirm otherwise. We ask BOEM to clarify what separation distance applies to non-listed large whales. MMST-14 provides that vessels maintain a separation of 500 meters from "all listed species of whales" and a separation distance of 50 meters from "small cetaceans" but the measure does not specify a separation distance for large whales that are not "listed." We recommend that BOEM require a separation distance of at least 100 meters between vessels and all non-listed cetaceans. We also recommend that BOEM remove the option for lessees to apply for a waiver of MMST-14's restrictions until near real-time monitoring technologies for North Atlantic right whales are developed and shown to provide comparable or greater vessel strike risk reduction than a 10-knot speed restriction.	

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BOEM-2024-0001-0439-0054	Measure ID: MMST-2 Measure Name: Impact Pile-Driving Monitoring Plan Description: In the case where low noise foundation types are not practicable and impact pile-driving is required Lessees must submit a final Pile-Driving Monitoring Plan (PDM Plan) to BOEM (renewable_reporting@boem.gov) BSEE (via TIMSWeb and protectedspecies@bsee.gov) and NMFS for review 120 days prior to the commencement of pile-driving activities. The Lessee must resolve all comments to BOEM and BSEE's satisfaction on the plan before operations can begin and operations must be conducted according to the plan. The plan will detail all plans and procedures for any noise mitigation used as well as for monitoring ESA-listed whales and sea turtles during all impact and vibratory pile-driving. The PDM Plan must:4. Contain information on the visual and PAM components of the monitoring describing all equipment procedures and protocols. Demonstrate that the PAM system has a near-real-time capability of detection to the full extent of the 160 dB distance from the pile-driving location. Include a detection confidence that a vocalization originated from within the clearance and shutdown zones to determine that a possible NARW has been detected. Any PAM detection of a NARW within the clearance/shutdown zone surrounding a pile must be treated the same as a visual observation and trigger any required delays in pile installation. Ensure that the full extent of the harassment distances from piles are monitored for marine mammals and sea turtles to document all potential take. Include number of PSOs that will be used the platforms or vessels upon which they will be deployed and contact information for the PSO providers. Include an Alternative Monitoring Plan (see MMST-1) that provides for enhanced monitoring capabilities in the event that poor visibility conditions unexpectedly arise and pile-driving cannot be stopped. Describe a communication plan detailing the chain of command mode of communication and decision authority. Include reporting PSO and crew member/equipment operator titles and responsibilities including who makes determinations of equipment shutdown feasibility. PSOs as determined by NMFS and BOEM must be used to monitor the area of the clearance and shutdown zones. Seasonal and species-specific clearance and shutdown zones must also be described in the PDM Plan including time-of-year	The detailed Impact Pile-Driving Monitoring Plans submitted by the lessees will be evaluated on a project-by-project basis. The AMMM measures in the NY Bight PEIS are only being analyzed for the six NY Bight lease areas.

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	requirements for NARWs. A copy of the approved PDM Plan must be in the possession of and followed by the Lessee Representative the PSOs impact-hammer operators and any other relevant designees operating under the authority of the approved COP and carrying out the requirements on site. Category: T/E BACP Comment: NMFS/BOEM need to define what is needed to "demonstrate that the PAM system has a near real-time capability of detection to the full extent of the 160 dB distance from the pile-driving location". PSOs should not be required to monitor to the extent of the Level B zone as this would likely not be feasible without increasing the number of vessels. More vessels on the water increase the human safety risk the environmental risk (including the risk of vessel strikes) and the costs of the project. BOEM should consult with NMFS to ensure consistency on requirements for visual and PAM detection for clearance and exclusion zone sizes as this statement could conflict with the ITA requirements for specific projects. In addition the language "Ensure that the full extent of the harassment distances from piles are monitored for marine mammals and sea turtles to document all potential take." is problematic as the Level B zones can be large (in particular for vibratory piling) and NMFS OPR has historically NOT required their full monitoring. It's an exercise in diminishing returns if there is no additional mitigation measure to be taken and take is authorized for the level B extent. It also has the potential to increase environmental impacts if more vessels are needed to meet the monitoring requirement. These impacts should be weighed against the potential benefits of this measure in the PEIS and should be carefully weighed when determining the reasonableness of this measure. Finally is this standard being applied to other marine industries? Will it be applied by BOEM to multi air gun activities in the Gulf of Mexico?	
BOEM-2024-0001-0439-0056	Measure ID: MMST-4 Measure Name: Establishment of foundation pile-driving measures Description: The following measures apply to all foundation pile driving activities: 1. Time of Day Restrictions: Foundation pile-driving may commence only during daylight hours unless an Alternative Monitoring Plan has been submitted and approved (see MMST-1). Foundation pile-driving may begin no earlier than 1 hour after (civil) sunrise. Foundation	MMST-4 has been edited to clarify that the shutdown zone for sea turtles will be determined at the project-specific COP NEPA stage.

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	pile-driving may not be initiated any later than 1.5 hours before (civil) sunset. Foundation pile-driving may continue after dark only when the installation of the same pile began during daylight hours (1.5 hours before civil sunset) when clearance zones were fully visible for at least 30 minutes and only when they must proceed for human safety or installation feasibility reasons. 2. The Lessee must deploy at least two PSOs on duty on the foundation pile-driving platform or nearby construction vessel in the immediate vicinity of the foundation pile-driving platform at all times during foundation pile-driving to visually monitor for marine mammals. 3. Monitoring must take place from 30 minutes immediately prior to initiation of foundation pile-driving activity through 30 minutes post-completion of foundation pile-driving activity. 4. For all foundation pile-driving activity the Lessee must follow designated clearance zones. 5. Foundation pile-driving may only commence when the clearance zones are fully visible (e.g. not obscured by darkness rain fog) unless an Alternative Monitoring Plan (see MMST-1) has been submitted and approved and only when clearance zones are clear of marine mammals for at least 30 minutes immediately prior to foundation pile-driving as determined by the lead PSO. 6. If a marine mammal is visually detected entering or within designated shutdown zones after foundation pile-driving has commenced a shutdown of foundation pile-driving must be implemented. 7. Following a shutdown foundation pile-driving may not commence until appropriate conditions (i.e. measures 15 above) have been met. 8. Pile-driving of wind turbine foundations and OSSs in the wind development area must not occur from January 1 through April 30. Impact pile-driving must not occur in December unless unanticipated delays due to weather or technical problems arise notified to and approved by BOEM that necessitate extending impact pile-driving into December. For sea turtles: To ensure that foundation pile-driving operations are carried out in a way that minimizes the exposure of listed sea turtles to noise that may result in injury or behavioral disturbance PSOs will establish a 1640-foot (500-meter)	

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	shutdown zone for all foundation pile-driving activities. Adherence to the 1640-foot (500-meter) shutdown zones must be reflected in the PSO reports. Any visual detection of sea turtles within the 1640-foot (500-meter) shutdown zones must trigger the required shutdown in pile installation. Upon a visual detection of a sea turtle entering or within the shutdown zone during foundation pile-driving the Lessee must shut down the pile-driving hammer (unless activities must proceed for human safety or for concerns of installation feasibility) from when the PSO observes until: 1. The lead PSO verifies that the animal(s) voluntarily left and headed away from the clearance area; or 2. 30 minutes have elapsed without re-detection of the sea turtle(s) by the lead PSO. Additionally if shutdown is called for but the Lessee determines shutdown is not technically feasible due to human safety concerns or to maintain installation feasibility reduced hammer energy must be implemented when the lead engineer determines it is technically feasible to do so. Previously Applied as a COP T&C: Check Category: T/EACP Comment: A 500m EZ for Sea Turtles is not feasible to monitor at night.	
BOEM-2024-0001-0450-0062	Measure ID and Name: MMST-4: Establishment of foundation pile-driving measures Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion): "The following measures apply to all foundation pile driving activities:1. Time of Day Restrictions: Foundation pile-driving may commence only during daylight hours. [Strikethrough: unless an Alternative Monitoring Plan has been submitted and approved (see MMST-1).] Foundation pile-driving may begin no earlier than 1 hour after (civil) sunrise. Foundation pile-driving may not be initiated any later than 1.5 hours before (civil) sunset. Foundation pile-driving may continue after dark only when the installation of the same pile began during daylight hours (1.5 hours before civil sunset) when clearance zones were fully visible for at least 30 minutes and only when they must proceed for human safety or installation feasibility reasons3. Monitoring must take place from [Strikethrough: 30] [Underline: 60] minutes immediately prior to initiation of foundation pile-driving activity through 30 minutes post-completion of foundation pile-driving activity 5. Foundation pile-driving may only commence when	The lessee must demonstrate that its Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan (MMST-1) is effective. MMST-4 has been edited to clarify that monitoring must take place from 60 minutes immediately prior to initiation of foundation pile-driving activity through 30 minutes post-completion of foundation pile-driving activity.

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	the clearance zones are fully visible (e.g. not obscured by darkness rain fog) [Strikethrough: unless an Alternative Monitoring Plan (see MMST-1) has been submitted and approved] and only when clearance zones are clear of marine mammals for at least 30 minutes immediately prior to foundation pile-driving as determined by the lead PSO. Notes: As stated above regarding MMST-1 we recommend that BOEM remove the option to submit an Alternative Monitoring Plan to allow commencement of pile-driving activities during low visibility conditions and nighttime. We also recommend that BOEM require monitoring to take place 60 minutes immediately prior to initiation of pile-driving instead of 30 minutes. The extended monitoring period will increase the likelihood that any marine mammals or sea turtles in the area are detected.	
BOEM-2024-0001-0439-0066	Measure ID:1. The lead PSO verifies that the animal(s) voluntarily left and headed away from the clearance area; or2. 30 minutes have elapsed without re-detection of the sea turtle(s) by the lead PSO. Additionally if shutdown is called for but the Lessee determines shutdown is not technically feasible due to human safety concerns or to maintain installation feasibility reduced hammer energy must be implemented when the lead engineer determines it is technically feasible to do so Measure Name: Description: Previously Applied as a COP T&C: Category: ACP Comment: Measure ID:MMST-5Measure Name: PSO coverage of expanded clearance/shutdown zones Description: Lessees must ensure that if the clearance and/or shutdown zones are expanded PSO coverage is sufficient to reliably monitor the expanded clearance and/or shutdown zones. Additional observers must be deployed on additional platforms for every 4921 feet (1500 meters) that a clearance or shutdown zone is expanded beyond the distances modeled prior to verification. Previously Applied as a COP T&C: Check Category: BACP Comment: This measure requires PSOs be deployed on additional platforms when exclusion zones are expanded beyond expected levels by 1500 meters which creates unnecessary hazards to human health and safety and is contrary to the goals of the MMPA and ESA (increasing the amount of operating vessels in the wind farm increases the risk of vessel strike). Additionally PSOs are capable of conducting visual monitoring at distances much greater than 1500 meters thus this	Thank you for your comment. Both MMST-4 and MMST-5 have been updated in the Final PEIS for clarity.

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	distance should be increased to reduce the amount of vessel traffic in the area. While it is understood that coordination and overlapping of visual monitoring within the expanded zones is necessary for situational awareness of all protected species adding additional platforms for every increase of the EZ by 1500 meters is overly conservative and creates undue burden and potential harm to humans and protected species. This is particularly important as developers begin to utilize vibratory hammers which while less impactful to marine mammals when modeled using the NOAA Fisheries definition for the Level B harassment threshold for non-impulsive sound (120 dB 1 uPa) requires monitoring and mitigation for much larger exclusion zones. Ambient ocean noise measures at a similar threshold to the NOAA Fisheries definition for the Level B harassment threshold for non-impulsive sound which increases the risk for other anthropogenic noise sources to interfere with the accurate in situ measurement to the Level B harassment threshold for vibratory hammer use and could potentially require a large fleet of PSO support vessels operating around the piling platform.	
BOEM-2024-0001-0450-0063	Measure ID and Name:MMST-7:PSO coverage and training requirements Proposed Changes to Measure Description (underlined text indicates addition; strikethrough text indicates deletion):"Lessees must ensure that PSO coverage is sufficient to reliably detect whales and sea turtles at the surface in clearance and shutdown zones to execute any pile-driving delays or shutdown requirements...A sufficient number of PSOs must be deployed to record data in real time and effectively monitor the affected area for the project including visual surveys in all directions around a pile PAM and continuous monitoring of sighted NARWs in the area to meet the number of PSOs required for enhanced seasonal monitoring requirements.[Underline: During pile-driving monitoring of the visual clearance and exclusion zones should be undertaken by vessel-based PSOs stationed at the pile driving site and on additional vessels circling the pile driving site as needed. On each vessel there must be a minimum of four PSOs following a two-on two- off rotation each responsible for scanning no more than 180 of the horizon per pile driving location. To effectively monitor the full exclusion zone multiple PSOs should be stationed at several vantage	Thank you for your comment. MMST-7 has been updated in the Final PEIS for clarity. Generally, the number of PSOs needed is dependent on several variables, including protected species monitoring plans. Specific numbers of PSOs will be determined fully at the project-specific COP NEPA stage.

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	points at the highest level to allow each to continuously scan a section of the exclusion zone.] PSOs must not be on watch for more than 4 consecutive hours with at least a 2-hour break after a 4-hour watch. PSOs must not work for more than 12 hours in any 24-hour period (Baker et. Al 2013) unless an alternative schedule is approved by BOEM..."Notes: We generally support MMST-7 which requires sufficient PSO coverage during pile-driving activities. We recommend that at each pile-driving location during pile-driving activities BOEM require a minimum of four PSOs following a two-on two-off rotation with each PSO responsible for scanning no more than 180 of the horizon.	
BOEM-2024-0001-0450-0052	1) Design floating offshore wind turbines to avoid entanglement risk: a) Design and maintain mooring lines and inter-array cables in configurations that minimize the potential for entanglement of marine species by: i) Ensuring that lines and cables remain under tension and avoiding catenary moorings; [Footnote 31: Marine species are more likely to become entangled in slack lines. "Taut mooring configurations are preferable because less slack in lines is likely to reduce entanglement potential (Benjamins et al. 2014). Highest relative risk may occur with catenary moorings given that the lines are not taut. Chains and nylon ropes are thought to have higher snagging potential as do accessory buoys." Maxwell Sara M. et al. 2022.] ii) Burying inter-array cables or establishing a minimum depth of 200 m for free floating inter- array cables (where burial of cables is not possible); iii) Using large diameter (approximately 2 m) accessory buoys to stabilize catenary mooring lines and free-floating inter-array cables; andiv) Employing large diameter wire rope or cable and avoiding chains and synthetic fiber ropes due to higher snagging potential. b) Design infrastructure to facilitate visual or acoustic detection of ensnared marine debris by monitoring equipment and personnel for example by using lighter coloration or for acoustic detection textures to contrast with marine debris at depths where light is limited.	BOEM has reviewed the suggested AMMM measure and determined that it is out of scope for this PEIS because the RPDE does not consider floating offshore wind structures.

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	i) Infrastructure includes for example platforms substations mooring lines inter-array cables and anchors as well as monitoring technology docking stations.	
BOEM-2024-0001-0450-0053	2) Conduct monitoring for entanglement that combines continuous and automated monitoring technologies with regular inspections and surveys of all floating offshore wind infrastructure throughout construction and operations: a) Conduct continuous monitoring for strains on mooring lines and inter-array cables resulting from ensnarement of marine debris or entanglement of an animal. i) Outfit all mooring lines with load cells [Footnote 32: "the Kincardine Floating Offshore Wind Farm in Scotland has integrated load cells with the mooring lines to periodically monitor line performance and potentially detect the entanglement of floating marine debris including derelict fishing gear." SEER Educational Research Brief on Risk to Marine Life from Marine Debris & Floating Offshore Wind Cables Systems (p.5). https://tethys.pnnl.gov/sites/default/files/summaries/SEER-Educational- Research-Brief-Entanglement-Considerations.pdf.] with sufficient detection resolution to detect significant accumulations of secondary entanglement hazards and for entanglement events. Outfit all inter-array cables with vibration and fault sensors as well as load cells at all floating offshore wind turbine attachment points and potentially at accessory buoy attachment points if present. b) Conduct monitoring underneath each floating offshore wind platform sufficient to detect accumulated secondary entanglement hazards and marine species presence in and around the array. Install multibeam systems with automatic detection capabilities like the Biosonics Omnidirectional Marine Life Observer installed facing down underneath each individual floating offshore wind turbine. i) Multibeam systems used should operate at peak frequencies above the range of marine mammal audibility and with no or minimal leakage of sound within the range of marine mammal audibility. c) Conduct daily remote visual inspection of infrastructure for ensnarement of marine debris or entanglement of an animal[Footnote 33: Visual inspection at least once during each 24-	BOEM has reviewed the suggested AMMM measure and determined that it is out of scope for this PEIS because the RPDE does not consider floating offshore wind structures.

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	hour period may provide an alert of an entangled marine mammal or sea turtle or diving or plunging marine bird at an early enough point in time that rescue efforts can be made and the animal can be released alive.]at depths where marine debris is most likely to occur which is usually zero to five meters from the surface. i) Current suitable technologies for monitoring include cameras and remote aerial surveys. d) Conduct monthly inspection of the full length of submerged infrastructure (including platforms substations mooring lines inter-array cables and anchors as well as monitoring technology docking stations or other infrastructure as appropriate) for ensnared marine debris or entanglement of an animal. i) Vessel deployed underwater autonomous vehicles (AUV) and remotely operated vehicles (ROV) can be outfitted with side-scan and multi-beam sonar transponders and video cameras.[Footnote 34: ROVs may also be an important tool for marine debris removal at depth. The Kincardine Floating Offshore Wind Farm also "will use remotely operated vehicles and vessel-mounted sensors (such as multibeam sonar) to periodically survey floating cable systems which could also monitor for the presence of derelict fishing gear." SEER Educational Research Brief on Risk to Marine Life from Marine Debris & Floating Offshore Wind Cables Systems (p.5). https://tethys.pnnl.gov/sites/default/files/summaries/SEER-Educational-Research-Brief-Entanglement- Considerations.pdf. See also Federal Energy Regulatory Commission (FERC) Environmental Assessment for Hydropower License for the PacWave South Project (April 2020) at p. xvi. https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/environmental- analysis/PacWave%20South%20EA.pdf; and "The Atlantic Testing Platform for Maritime Robotics." https://www.atlantis-h2020.eu/.] e) Outfit operations and maintenance vessels with equipment capable of locating and removing an entanglement hazard. i) Vessels should be of sufficient size (40 feet or greater in length) have winches or cranes with load capacities suitable for commercial fishing have equipment necessary to support both SCUBA and	

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	surface-supply air diving and be able to accommodate launching operating and retrieving a working-class ROV. f) Integrate floating offshore wind arrays into reporting systems tracking lost fishing gear in order to improve response time to remove entanglement risks.	
BOEM-2024-0001-0450-0054	3) Adaptive use of inspection results. a) Project proponents may propose an adaptive approach to scheduling inspections in COP submittals. Monthly inspections should be used to validate continuous monitoring approaches by confirming the location of ensnarement or entanglement events detected by a continuous monitoring system or identifying events that were missed by such a system during early application of the technology. If marine debris ensnarements or marine life entanglements are observed during these monthly inspections within the first 12 months of an offshore windproject's operation the frequency of full-infrastructure inspections should be increased. If monthly inspections detect no marine debris ensnarements or marine life entanglements during the first year of an offshore wind project's operation the frequency of full-infrastructure inspections may be decreased.	BOEM has reviewed the suggested AMMM measure and determined that it is out of scope for this PEIS because the RPDE does not consider floating offshore wind structures.
BOEM-2024-0001-0450-0055	4) Protocol when ensnarement and/or entanglements are identified: [Footnote 35: Protocol is adapted from the Federal Energy Regulatory Commission (FERC) Environmental Assessment for Hydropower License for the PacWave South Project (April 2020). https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/environmental-analysis/PacWave%20South%20EA.pdf.] a) If monitoring shows that marine debris has become ensnared on any project structure or that sharks and/or diving or plunging marine birds are entangled in marine debris ensnared on any project structure the lessee must notify the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS) as appropriate the U.S. Coast Guard and the relevant state agency as soon as possible and within 6 hours of detection. If the appropriate federal and state agencies determine that the lessee should remove the marine debris and any entangled sharks or diving or plunging marine birds or any other species the lessee shall take such action as	BOEM has reviewed the suggested AMMM measure and determined that it is out of scope for this PEIS because the RPDE does not consider floating offshore wind structures.

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	soon as is possible to do so in a manner that does not jeopardize human safety property or the environment. b) If monitoring shows that marine mammals or sea turtles are entangled in marine debris ensnared on any project structure the lessee shall immediately follow the Reporting Protocol for Injured or Stranded Marine Mammals or the sea turtle reporting protocol developed by the Sea Turtle Disentanglement Network; and provide the federal and relevant state agencies with all available information on the incident.[Footnote 36: See National Marine Fisheries Service Large Whale Entanglement Response Program for whale entanglement reporting protocol Greater Atlantic region: https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life- distress/marine-mammal-entanglement-greater-atlantic-region; Sea Turtle Disentanglement Network for sea turtle reporting protocol: https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/sea- turtle-disentanglement-network).]	
BOEM-2024-0001-0450-0057	6) Require transparent reporting of ensnarement and entanglement data. a) All incidences of observed ensnarements of marine debris on floating offshore wind infrastructure and entanglements of marine life shall promptly be made publicly available.	BOEM has reviewed the suggested AMMM measure and determined that it is out of scope for this PEIS because the RPDE does not consider floating offshore wind structures.
BOEM-2024-0001-0450-0032	2) Require diel restrictions on site assessment and characterization activities: a) Site assessment and characterization activities must not be initiated within 1.5 hours of civil sunset or in times of low visibility when the visual clearance zones and exclusion zones (defined in Section II(3) below) cannot be visually monitored as determined by the lead Protected Species Observer (PSO) on duty.	Thank you for your comment. BOEM has reviewed the suggested AMMM measure and will not require it at this time. Exclusion zones are small and, in the event of low visibility, Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plans are required.
BOEM-2024-0001-0439-0092	Measure ID: ST-1 Measure Name: Monitoring zone for sea turtles for pile-driving Description: Lessees must monitor the full extent of the area where noise would exceed the 175 dB re 1 Pa received level behavioral threshold for sea turtles for the full duration of all pile-driving activities and for 30 minutes following the cessation of pile-driving activities. Lessees must record all observations to ensure that all take that occurs is documented (see MUL-32 and MUL-34).Previously Applied as a COP T&C: Category: T/EACP Comment: A sea turtle clearance and monitoring measure is acceptable however	Thank you for your comment. ST-1 has been removed from the Final PEIS. BOEM agrees that the distance of the monitoring zones should be determined through acoustic modeling during project-specific analysis. This is now captured in MMST-4.

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	it may not be achievable at night as thermal camera tools are not effective for sea turtles. This issue is recognized by NOAA NMFS and should not be a barrier to night-time piling. The language in this and related AMMMs should be modified to account for limitations of observation in nighttime conditions or at minimum deferred to project specific analysis.	
BOEM-2024-0001-0451-0006	ST-2 Monitoring for sea turtles and reporting a. Between June 1 and November 30 the Lessees must have a trained lookout posted on all vessel transits during all phases of the project to observe sea turtles. The trained lookout must communicate any sightings in real-time to the captain so that the requirements in (e) below can be implemented. This condition is not considered reasonable or feasible to have a dedicated lookout on all vessels. Some vessels such as tugs and barges are small and will have a limited field of view. b. The trained lookout must maintain a vigilant watch and monitor a Vessel Strike Avoidance Zone (1640 feet [500 meters]) at all times to maintain minimum separation distances from ESA-listed species. Alternative monitoring technology (e.g. night vision thermal cameras) will be available to ensure effective watch at night and in any other low visibility conditions. If the trained lookout is a vessel crew member this must be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts must receive training on protected species identification vessel strike minimization procedures how and when to communicate with the vessel captain and reporting requirements. This language requires a dedicated observer (crew member with no other duties) on all vessels (regardless of size or vessel speed) south of NC/VA and north of NC/VA from June 1-Nov 30 to monitor for sea turtles. This is overly burdensome and is also ineffective as observers rarely see turtles. d. "Vessel captains/operators must avoid transiting through areas of visible jellyfish aggregations or floating sargassum lines or mats. If operational safety prevents avoidance of such areas vessels will slow to 4 knots (7.4 kilometers per hour) while transiting through such areas. "This is not feasible with the large construction vessels. It is impractical to expect that a PSO will see a jellyfish and that the	Thank you for your comment. ST-2 was incorporated into MMST-14 and removed from the Final PEIS. Operators would have to respond to observed jellyfish aggregations or floating Sargassum lines or mats if they can be avoided safely and in time, which is now included in MMST-14.

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	vessel can slow to avoid the jellyfish. By the time the jellyfish is spotted it will be too late.	
BOEM-2024-0001-0439-0093	Measure ID: STF-1 Measure Name: Monitoring on strategically placed WTGs Description: Lessees are encouraged to incorporate technologies for detecting tagged (e.g. Innovasea) sea turtles and highly migratory fish in their project to monitor the effect of increases in habitat use and residency around WTG foundations. The Lessees are encouraged to share monitoring results and propose new or additional mitigation measures and/or monitoring methods if appropriate. Previously Applied as a COP T&C: Category: VACP Comment: The PEIS indicates that this measure is voluntary. Voluntary measures should not be included in AMMMs.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts. Furthermore, these RPs are also not part of the Proposed Action, Alternative C, which analyzes only AMMM measures previously applied as T&Cs and AMMM measures not previously applied as T&Cs.
BOEM-2024-0001-0347-0004-i	STF-1: Monitoring on strategically placed wind turbines We support incorporation of technologies to detect tagged marine life within the wind project areas and sharing of the associated data. However we question if this AMMM measure serves a meaningful purpose given that it is phrased as encouragement but not a requirement.	Based on comments received on the Draft PEIS, BOEM has reviewed all draft measures and categorized them as 1) AMMM measures previously applied as T&Cs or through other mechanisms such as a Biological Opinion or Memorandum of Agreement, 2) AMMM measures not previously applied as T&Cs, and 3) RPs.
BOEM-2024-0001-0439-0094	Measure ID: STF-5 Measure Name: Trailing suction hopper dredge mitigation Description: If a trailing suction hopper dredge is used offshore operators must disengage dredge pumps when the dragheads are not actively dredging and therefore working to keep the draghead firmly on the bottom in order to prevent impingement or entrainment of ESA-listed fish and sea turtle species. Pumps must be disengaged when lowering dragheads to the bottom to start dredging turning or lifting dragheads off the bottom at the completion of dredging. Previously Applied as a COP T&C: Category: ACP Comment: The definition of "firmly" requires clarification. Drag arms have jets that mobilize the soil which is then pumped into the dredge hopper. The drag arm is never fully resting on the bottom because of this.	STF-5 was updated in response to this comment as follows: “A state-of-the-art solid-faced deflector that is attached to the draghead must be used on all hopper dredges at all times.” Please see Section 3.1, *Hopper dredge requirements* in Appendix B, *2020 SARBO General PDCs* (HOPPER.2, page 530) of SARBO 2020 (found here: https://media.fisheries.noaa.gov/dam-migration/sarbo_acoustic_revision_6-2020-opinion_final.pdf).
BOEM-2024-0001-0528y	With respect to the AMMM measures proposed in Appendix G, we're very happy to see the inclusion of a number of proposed voluntary mitigation measures that have never been required before. For example, the AMMM measures that encourage facility planning to use nature-inclusive design and favor the selection of	Thank you for your comment. The RPDE for the PEIS includes a range of representative parameters of offshore wind development in the NY Bight, as described in Section 2.1.2.1. Each COP submitted within the NY Bight will be required to identify the proposed spacing, turbine height, rotor diameter,

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	low-noise foundation types. But it's not entirely clear how the project design envelope approach, which considers the maximum potential impacts, squares up with BOEM's encouragement of quiet foundations. So, we encourage BOEM to include approaches that incentivize the use of quiet foundations and designs that benefit biodiversity. We'd also really like to understand better how the proposed voluntary mitigation measures are intended to apply or inform construction operation plans.	and other parameters of the project. Regarding the wide range of parameters, the RPDE *was developed with input from the six NY Bight lessees,* American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. Because the RPDE covers six lease areas of differing sizes and was developed before lessees submitted their COPs, a wide range of potential parameters was used to ensure the maximum potential impacts from development in the NY Bight could be assessed. This RPDE was used for the analysis in Alternative B and Alternative C. BOEM has clarified that Alternative B serves to compare how impacts would change with the AMMM measures identified in Alternative C. Based on comments on the Draft PEIS, BOEM has reviewed all AMMM measures, which resulted in many revisions, including separating AMMM measures that have and have not been previously applied; BOEM believes these are all feasible. In addition, several AMMM measures were reclassified as RPs in the Final PEIS. These RPs are not part of the Proposed Action. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impact. Project-specific NEPA analysis for individual COPs could apply revised, additional, or different AMMM measures as needed. MUL-12 and MUL-6 have been reclassified as RPs. Details regarding ecological design elements and foundations are project-specific and will be analyzed at the subsequent COP-specific NEPA stage if proposed as part of the COP. MUL-6 has been updated to include submission of a report providing rationale for why non-pile-driving foundations are not possible, if non-pile-driving foundations are not used.
BOEM-2024-0001-0310m	So, BOEM, for your next document I looked through your mitigations and I see you're very weakly handing -- you identify a lot of things you want to mitigate, but not -- you don't really say force them to be mitigated. So you're still not protecting us.	The purpose of the PEIS, as described in Chapter 1, *Purpose and Need*, is to analyze the effects from potential development activities in the six NY Bight lease areas and to identify and analyze AMMM measures that could reduce those effects. The PEIS does not approve any projects. Each individual COP submitted by a developer to BOEM will be separately analyzed as required under NEPA and will disclose the full impacts of the

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		construction and installation, O&M, and conceptual decommissioning of the project, including cumulative effects. BOEM has modified the PEIS language describing the Proposed Action and has refined the language throughout the PEIS to make clear that this PEIS is not imposing any AMMM measures. It is not establishing or imposing any substantive obligations at this programmatic stage. Instead, it is identifying those AMMMs that BOEM may impose at the COP-specific NEPA stage. By identifying and analyzing those AMMMs now, the expectation is that the analysis at the COP-specific NEPA stage can be more streamlined and efficient.

P.5.24 Cumulative Impacts

Table P.5-24. Responses to Comments on Cumulative Impacts

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BOEM-2024-0001-0309-0004	Indeed the PEIS process by BOEM gives short shrift to the mitigation and analysis process of the offshore coasts and cumulative impacts by only providing summary estimates of impacts and providing no plans[Footnote 5: "Each lease holder is [Bold: likely] to submit at least one COA but it is not required. Emphasis added.] for any of the six NY Bight projects in opposition to its own acknowledgement of the cumulative impacts that this project will have combined with BOEM's other lease areas. Appendix C of the PEIS provides for how the Project will be used; however the qualified impact does not act the way the Project was designed. [Footnote 6: PEIS Appendix C: Tiering Guidance provides for evaluation of impacts that could result from wind energy development in the NY Bight lease areas as well as the AMMM reasons for a nebulous Construction and Operations (COP) Plan analysis perhaps in the future.] The PEIS is faster for the federal government but at the same time its vagueness is giving the wind industry a free pass at the expense of the local environment New Jersey's local economies the health and welfare of its human marine avian and other coastal inhabitants and ocean floor - all of which will be exposed to and have their ecosystems severely disrupted because of BOEM's inefficiencies in the PEIS process. Further the Atlantic City area disproportionally will bear the effects of the six NY Bight lease areas' cumulative effects on an already overburdened population. [Footnote 7: See PEIS at Table D1-9 3.6.4 at C-11 and C-12; see also N.J.S.A. 13:1D-157 et seq.; https://dep.nj.gov/ej/law/.; Atlantic Shores Federal Consistency Certification Request published by New Jersey Department of Environmental Protection September 19 2023 (overburdened communities include Brigantine NJ in Atlantic County NJ).]The Council on Environmental Quality ("CEQ") and NEPA define cumulative impacts as "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." [Footnote 8: 40 C.F.R. 1508.7.]	The CEQ NEPA Implementing Regulations require the impact analysis for NEPA documents to include cumulative effects, defined as the effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions. The cumulative impact analysis for the No Action Alternative considers the impacts of ongoing activities and other reasonably foreseeable planned activities, excluding the Proposed Action, as described in Appendix D, *Planned Activities Scenario*. The cumulative impacts analysis for the Proposed Action considers the full buildout of the six NY Bight lease areas in combination with other reasonably foreseeable planned activities, including offshore wind activities, within the geographic analysis area for each Chapter 3 resource topic. Ongoing activities that would contribute to baseline conditions, including offshore wind activities but excluding the Proposed Action, are described under the No Action Alternative. Offshore wind activities that have already been constructed (e.g., Block Island Wind Farm offshore Rhode Island and Coastal Virginia Offshore Wind [CVOW] Pilot Project offshore Virginia) or that have an approved COP (e.g., Vineyard Wind 1, South Fork Wind Farm, Revolution Wind, Ocean Wind 1) are considered ongoing activities and have been included in the No Action Alternative. Further, during project-specific COP NEPA reviews for the NY Bight lease areas, BOEM would conduct cumulative impact analyses again, but those analyses would be based on project-specific information and any new information on past, present, and reasonably foreseeable actions that are available at that time. BOEM notes that this PEIS does not approve any projects in the NY Bight lease areas.

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BOEM-2024-0001-0309-0005	BOEM has acknowledged the cumulative effects of their offshore wind program going back to 2007 with their PEIS for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf. [Footnote 9: Bureau of Ocean Energy Management United States Department of the Interior Guide to the OCS Alternative Energy Final Programmatic Environmental Impact Statement https://www.boem.gov/ renewable-energy/guide-ocs-alternative-energy-final-programmatic- environmental-impact-statement-is.] With this PEIS for the NY Bight Project BOEM intends to provide a "baseline analysis that helps to satisfy the requirements of NEPA for offshore renewable energy leasing" [Footnote 10: Id; PEIS 2.1.1 at 2-2.] because "many wind energy projects will have similar environmental impacts." [Footnote 11: Id.] This PEIS does not satisfy NEPA's cumulative impacts requirement today because BOEM has significantly altered and expanded their offshore wind program not only over the years but even in the past nine months making the PEIS's "analysis of cumulative environmental impacts inaccurate and outdated and requiring a supplemental or new Environmental Impact Statement analyzing the current program as it now exists." [Footnote 12: Complaint Cape May v. U.S. Dept. of the Interior BOEM et al. No. 23-cv-21201 (D.N.J. Oct. 17 2023).]These are legitimate concerns that many longstanding and respected environmental groups have expressed. For example at the last virtual public hearing for the PEIS held on February 13 2024 the Nature Conservancy expressed concern about the lack of plans among other things. [Footnote 13: Public comments from the February 13 2024 virtual hearing for BOEM Docket No. 2024-0001 are pending.] This is a global environmental conservation group in existence for over 73 years. [Footnote 14: See Comments by The Nature Conservancy BOEM Hearing February 13 2024; see also Turbine Reefs Technical Report The Nature Conservancy November 2021 https://www.nature.org/content/dam/tnc/nature/en/documents/TurbineReefReport_Nature-BasedDesignsOffshoreWindStructures_Final2022.pdf (admitting knowledge and "informational gaps exist regarding documented benefits to marine environments where NBD has been implemented around offshore wind infrastructure" at 1.4).] So too did Clean	Please refer to responses to comments BOEM-2024-0001-0309-0004, BOEM-2024-0001-0331-0011, and BOEM-2024-0001-0319-0001. The CEQ NEPA Implementing Regulations require the impact analysis for NEPA documents to include cumulative effects, defined as the effects on the environment that would result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions. The Final PEIS has been updated as appropriate to reflect changes to projects included in the cumulative impact analysis.

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	Ocean Action publicly comment a 40-year old local New Jersey Shore organization advocating for the environment. [Footnote 15: Id. BOEM Public Hearing held on February 13 2024.]Why the rush? "Reduce Redundancies" and "Timely" are the hallmarks of the PEIS process to make it efficient and streamlined for the government but not for the environment or the public. [Footnote 16: See PEIS ES.2 at ES-3.] It comes off as political expediency and industrializing the oceans rather than saving the environment from harm. The truth is the clock is ticking for BOEM from the presumptive time limit of two years for completing the EIS in accordance with the CEQ implementing regulations effective May 20 2022. [Footnote 17: See PEIS at ES-2.] Rather than reasoned analysis BOEM's failure to analyze the cumulative environmental impacts of its offshore wind program is arbitrary and capricious and violates NEPA. [Footnote 18: 5 U.S.C. 706.]	
BOEM-2024-0001-0309-0007	Mitigation of the cumulative effects of the projects situated behind overlapping projects are not even shown in the PEIS [Footnote 22: See PEIS at 3.6.6-28.] in violation of NEPA. [Footnote 23: 42 U.S.C. 4332(2)(C) (NEPA further requires that the Environmental Impact Statement provide a "detailed statement . . . on . . . alternatives to the proposed action . . . .").] For example more studies are needed to show that the noise from the pile driving and sonar activities are not certainly confusing the mammals and leading to localized stranding such as the baby seal pup only days ago ending up a quarter mile from the ocean right in the middle of a commercial street nearby along the New Jersey Shore in Ocean City. [Footnote 24: "Rescued Gray Seal Pup from Ocean City Dies Despite Treatment Efforts Shore Local February 22 2024. https://shorelocalnews.com/rescued-grey-seal-pup-from-ocean-city-dies-despite-treatment-efforts/#:~:text=The%20Marine%20Mammal%20Stranding%20Centera%20mile%20down%2042nd%20Street . ("The Marine Mammal Stranding Center reported that the male grey seal pup rescued last week from the streets in Ocean City has died. The pup was stranded on February 7 after hauling out from the bay and traveling a quarter of a mile down 42nd Street.")] Appendix D shows old studies based on 2019 five years ago not considering the cumulative impacts of the	Please refer to responses to comments BOEM-2024-0001-0309-0004 and BOEM-2024-0001-0331-0011. Analysis of the impacts of the Proposed Action and alternatives on listed species can be found in Section 3.5.1, *Bats*; Section 3.5.3, *Birds;* Section 3.5.6, *Marine Mammals*; Section 3.5.7, *Sea Turtles*; and Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*. Analysis of the increase in vessel traffic can be found in Section 3.6.6, *Navigation and Vessel Traffic*. In addition, BOEM must comply with ESA Section 7 to ensure that its action of approving offshore wind projects does not jeopardize the continued existence of any federally threatened or endangered species; this includes a cumulative effects analysis per requirements under ESA regulations. BOEM completes Section 7 consultation with the USFWS and the NMFS prior to the approval of any COP for offshore wind projects. BOEM will continue to consult with the USFWS and NMFS for future actions that may affect federally threatened and endangered species to ensure compliance with ESA Section 7.

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	additional BOEM lease sites thus nullifying the mitigation measures. [Footnote 25: See PEIS at D2-1.] One can only imagine the cumulative effects of thousands of vessel traffic [Footnote 26: See PEIS at 3.6.1.1.] and noise then layering the six lease projects in the NY Bight plus the additional BOEM lease areas all being worked on at once. The effects of which will result in not only thousands of "Takes" that BOEM estimated before the cumulative impacts of the NY Bight leases [Footnote 27: See BOEM 2023-0030.] likely only a starting number with additional EMFs sound noise and ill effects on humans as well. [Footnote 28: See NOAA-2024-00008 Jan. 5 2024 https://www.federalregister.gov/documents/2024/01/05/2024-00008/takes-of-marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to. Defend Brigantine Beach Inc. and Down beach's research team prepared a comprehensive 34 page Public Comment to NOAA dated February 5 2024 regarding Atlantic Shores new Take request to harass harm or injure more marine mammals with underground sound from their wind surveys discussing among other things the striking correlation between the more survey vessels there are the more whale deaths there are as a result at 9-11. See also PEIS at 3.5.2.2 et seq. and BOEM PEIS Docket No. 2023-0030.]	
BOEM-2024-0001-0313-0007	1.7 Methodology for Assessing the Representative Project Design Envelope Page 1-9 states "In general the maximum values in the RPDE represent the maximum scenario of development that could occur in the NY Bight lease areas. For example it is not expected that any of the NY Bight lease areas would contain more than 280 WTGs which is the upper end of the RPDE. Additionally the RPDE is not meant to be prescriptive or to establish limits for future development as new and emerging offshore wind technologies that have not yet been proposed in existing COPs or analyzed in the RPDE may be part of the development scenario for the NY Bight lease areas." Comment one of the most serious concerns is the lack of meaningful analysis of cumulative impacts and larger plan of scale of the offshore wind direct and indirect impacts. It appears that the PEIS acknowledges the lack of understanding and technologies and studies needed to perform the long term impacts of these projects	Please refer to responses to comments BOEM-2024-0001-0309-0004 and BOEM-2024-0001-0331-0011 for a description of the methodology and scope of the cumulative impacts analysis used in the PEIS. The RPDE was developed in coordination and with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. BOEM has prepared the PEIS to (1) identify and analyze AMMM measures that could avoid, minimize, mitigate, and monitor impacts on the resources in the six NY Bight lease areas and (2) focus project-specific environmental analyses. Potential project-specific impacts will be considered in detail in a COP-specific NEPA analysis.

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	which is extremely problematic and in effect prevents any conclusion that there is not an irreversible potential impacts from this project that could be more environmentally deleterious than any projected climate impacts the project is intended to mitigate.	
BOEM-2024-0001-0313-0010	Cumulative impacts of all offshore wind impacts are of paramount concern. Page 2-5 states "Spacing for OCS-A 0544 would be informed by lease stipulations which require either two common lines of orientation or a 2-nautical mile setback from the neighboring lease area OCS-A 0512. For the purposes of analysis two common lines of orientation based on the proposed spacing in the COP for OCS-A 0512 were assumed resulting in a spacing of approximately 0.68 x 0.68 nautical miles for OCS-A 0544 only." All environmental impacts especially pertaining to OCS-A 0512 which is substantially contiguous to OCS-A 0544 should be evaluated above just visual impacts as described later in the associated sections of the PEIS and Appendices. Additional comments on this issue are detailed later in this comment letter.	Please refer to response to comment BOEM-2024-0001-0331-0011. Impacts from OCS-A 0512 are described throughout the PEIS as part of the cumulative impacts analysis for each resource area. In addition, BOEM approved the COP for OCS-A 0512 (Empire Wind) on November 21, 2023; the full impact analysis, including cumulative impacts, can be found in the Empire Wind EIS: https://www.boem.gov/renewable-energy/state-activities/empire-wind-final-eis.
BOEM-2024-0001-0313-0015	As was the case in ORECRFP22-1 to help ensure the long-term viability of projects Proposals may include a price structure where the project's price would be subject to a one-time adjustment to reflect changes in certain price indices subsequent to the Proposal Submission Deadline. Proposals may also include a price structure that contemplates an Interconnection Cost Sharing approach. Proposals including these adjustments will be evaluated as described in Section 4 of the RFP. The public versions of the ORECRFP23-1 proposals are included below: Community Offshore Wind LLC - Community Offshore Wind 2 Empire Offshore Wind LLC Empire Wind 1 Sunrise Wind LLC Sunrise Wind As these changes would appear to impact the cumulative impact analysis the final PEIS should be updated to accurately reflect the changes including project timeline and construction impacts (short-term) and long- term impacts.	Thank you for your comment. The Final PEIS has been updated as appropriate to reflect changes to projects included in the cumulative impact analysis.
BOEM-2024-0001-0313-0066	There are a number of references to ongoing and planned projects some of which have been updated since publishing of this draft PEIS in so far as cumulative impact analysis is dependent on the accuracy of the planned projects all relevant sections of the PEIS should be thoroughly and comprehensively updated to reflect the ongoing and	Please refer to response to comment BOEM-2024-0001-0313-0015. The PEIS describes the impacts from construction and operation of onshore components generally and largely defers the analysis of onshore components to the COP-specific NEPA review because

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	planned projects as presented and updated where additional information is now available where it may have been speculative in nature at the time of writing of the draft PEIS. This includes but is not limited to the information on the NYSERDA website as of February 2024 updates to the Empire Wind 1 and 2 projects and the environmental assessment for the Beacon NY project. The Town has reiterated concerns about segmentation of the environmental review process and would again respectfully request that all projects and project components be disclosed and considered as part of the environmental review process. As interconnection points and infrastructure associated with energy transfer and storage are clearly part of this larger plan of scale the whole project must be considered in terms of cumulative impacts as not to improperly segment the review process. It is improper to segregate the impacts of offshore wind projects and the interconnection process because such facilities will be constructed pursuant to the NYISO open access transmission tariff and the state transmission facility siting process. Even if it is anticipated the facilities will be predominantly or entirely owned and operated by the transmission provider (not Empire Beacon Wind or a NY Bight lessee) these infrastructure upgrades and new facilities are functionally dependent on these alternative energy process and thus are an integral component of the environmental impact analysis that is not being discussed as a whole project. In fact it appears that the interconnection process affords flexibility as to which entity will construct certain facilities and the specific facilities (or portions thereof) various substation locations and the loop-in / loop-out lines that will be constructed will be determined in the interconnection and state transmission facility siting processes at the expense of the environmental review process.	the specific locations of onshore project components are not known at this time. While the onshore components are included in BOEM's analysis in the PEIS to support the evaluation of a complete project, BOEM's authority under OCSLA extends only to the activities on the OCS. BOEM also notes that the PEIS does not approve any projects.
BOEM-2024-0001-0313-0067	The NYSDEC SEQR Handbook 4th Edition states "1. What is segmentation? In 617.2(ah) of 6 NYCRR segmentation is defined as the division of the environmental review of an action so that various activities or stages are addressed as though they were independent unrelated activities needing individual determinations of significance. Except in special circumstances considering only a part or segment of an overall action is contrary to the intent of SEQR. There are two types of situations where segmentation typically	Please refer to response to comment BOEM-2024-0001-0313-0066

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	occurs. One is where a project sponsor attempts to avoid a thorough environmental review (often an EIS) of a whole action by splitting a project into two or more smaller projects. The second is where activities that may be occurring at different times or places are excluded from the scope of the environmental review. By excluding subsequent phases or associated project components from the environmental review the project may appear more acceptable to the reviewing agencies and the public." The Handbook goes on to states "Reviewing the "whole action" is an important principle in SEQR; interrelated or phased decisions should not be made without consideration of their consequences for the whole action even if several agencies are involved in such decisions. Each agency should consider the environmental impacts of the entire action before approving funding or undertaking any specific element of the action (see 617.3(g) regarding "Actions")." "All known or reasonably anticipated phases of a project should be considered in the determination of significance. If later phases are uncertain as to design or timing their likely environmental significance can still be examined as part of the whole action by considering the potential impacts of total build-out (SEQR Handbook page 54) However it appears that records of decision and findings of no significant impact are being presented by BOEM prior to any analysis of the potential environmental impacts of the points of interconnection and local impacts. "8. If projects are linked but will have separate sources of funding can they be reviewed separately? No. It is common in many projects to have a mix of funding sources (for example local highway construction affordable housing or economic development). If the various funding sources support the same project or a group of projects that are part of the same overall action then they should be examined in a single environmental review." (SEQR Handbook Page 55) Notable case law Village of Westbury v. Dept. of Transportation 75 NY2d 62 (1989); DOT issued a negative declaration for the reconstruction of a highway interchange. The Court found that the interchange reconstruction was closely linked to the widening of the Northern State Parkway which was also in the planning process and ruled that the projects must be considered as one action for the purposes of conducting an environmental review since they were	

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	complementary components of DOT's plan to alleviate traffic generally." (SEQR Handbook page 204)	
BOEM-2024-0001-0331-0005	The failure to disclose the environmental impacts of many key subjects such as audible turbine operating noise at the shore the failure to present the full impacts of others the extraordinary effort made to minimize the impact of others though creation of contrived baselines and scoring systems the failure to address cumulative impacts e.g. on North Atlantic right whale (NARW or "right whale") migration	The PEIS presents a description and analysis of potential impacts from ongoing activities and trends as part of the No Action Alternative analysis. The No Action Alternative provides a current baseline to analyze impacts from each of the action alternatives. Please refer to PEIS Section 3.5.6, *Marine Mammals*, for a discussion on cumulative impacts of the No Action and action alternatives on marine mammals, including the NARW.
BOEM-2024-0001-0331-0006	The offshore wind projects and lease sales should be paused until the forthcoming Government Accountability Office ("GAO") study on offshore wind development in the North Atlantic Planning Area is publicly released and federal state and local officials and agencies have an opportunity to review the report public a response and implement recommendations and there is a comprehensive offshore wind pilot program project in the New York Bight to assess the actual economic and environmental impacts of pre-construction construction operation and maintenance and decommissioning activities with independent oversight and an independent transparent investigation into marine mammal deaths off the NJ and NY coasts since December 2022 concluded with substantial evidence that offshore wind development is not a significant cause.	Two offshore wind projects, CVOW – Pilot and Block Island Wind Farm, have been in operation on the Atlantic Coast for over 3 years and 7 years, respectively. These projects have acted as pilot projects for offshore wind development in the region. Studies conducted at these offshore wind sites to evaluate actual impacts of the development, operations, and maintenance of offshore wind infrastructure have been incorporated into this Final PEIS. The Government Accountability Office study on offshore wind development in the North Atlantic Planning Area will be incorporated into the Final PEIS as appropriate if it is publicly available prior to publication of the Final PEIS.
BOEM-2024-0001-0331-0011	PEIS Lacking Regional Cumulative Analysis A major deficiency with this process is that the "regional cumulative analysis" only covers the New York Bight Area but excludes the lease areas next to it including but not limited to leases Ocean Wind 1 2 Atlantic Shores South and North and Empire Wind 12 as well as all the other projects off the east coast. How can this process be considered thorough when the cumulative impacts will be far greater than any suggested by the PEIS?	The geographic and cumulative impact analysis areas for each resource are defined by the anticipated geographic extent of impacts for the specific resource, as described in the introduction to each Chapter 3 resource section. For example, the analysis area for mobile resources—such as bats, birds, finfish and invertebrates, marine mammals, and sea turtles—includes the general range of these species. Depending on the resource, the geographic analysis area and cumulative impacts analysis may include only the NY Bight and nearby lease areas, or the full buildout of all lease areas along the U.S. Atlantic Coast.
BOEM-2024-0001-0331-0013	According to the October 2023 legal filings from Cape May County regarding offshore wind NEPA is in large measure an attempt by Congress to instill in the environmental decision making process a more comprehensive approach so that long-term and cumulative	Thank you for your comment. Please refer to the response to comment BOEM-2024-0001-0331-0011.

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	effects of small and unrelated decisions could be recognized evaluated and either avoided mitigated or accepted as the price to be paid for the major federal action under consideration. (Nat. Res. Def. Council Inc. v. Callaway 524 F.2d 79 88 (2d Cir. 1975); C.F.R. 1508.7.) The Council on Environmental Quality defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."	
BOEM-2024-0001-0331-0014	The United States has set a target of producing 30 Gigawatts (30000 megawatts) of Offshore Wind by 2030: To position the domestic offshore wind industry to meet the 2030 target DOI's Bureau of Ocean Energy Management . . . plans to advance new lease sales and complete review of at least 16 Construction and Operations Plans (COPs) by 2025 representing more than 19 GW of new clean energy for our nation Achieving this target also will unlock a pathway to 110 GW by 2050 (Biden Administration Fact Sheet: Biden Administration Jumpstarts Offshore Wind Energy" Projects to Create Jobs (March 29 2021) https://www.whitehouse.gov/briefing- room/statements-releases/2021/03/29/fact-sheet- biden-administration-jumpstarts-offshore-windenergy-projects-to-create-jobs/.) BOEM acknowledged the interrelated and cumulative effects of their offshore wind program in 2007 when they produced a Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf. (Bureau of Ocean Energy Management United States Department of the Interior Guide to the OCS Alternative Energy Final Programmatic Environmental Impact Statement https://www.boem.gov/ renewable- energy/guide-ocs-alternative-energy-final-programmaticenvironmental-impact-statement-is.) Defendants intended this Programmatic Environmental Impact Statement to provide a "baseline analysis that helps to satisfy the requirements of NEPA for offshore renewable energy leasing" because "many wind energy projects will have similar environmental impacts." This Programmatic Environmental	Please refer to responses to comments BOEM-2024-0001-0309-0004, BOEM-2024-0001-0331-0011, and BOEM-2024-0001-0319-0001. The CEQ NEPA Implementing Regulations require the impact analysis for NEPA documents to include cumulative effects, defined as the effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions. The Final PEIS has been updated as appropriate to reflect changes to projects included in the cumulative impact analysis.

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	Impact Statement does not satisfy NEPA's cumulative impacts requirement today because Defendants have significantly altered and expanded their offshore wind program rendering the Programmatic Environmental Impact Statement's analysis of cumulative environmental impacts inaccurate and outdated and requiring a supplemental or new Environmental Impact Statement analyzing the current program as it now exists. The New York Bight PEIS repeats the substantial error in the 2007 PEIS in that it does not include the cumulative impacts of any offshore wind projects off the NJ/NY coast as well as all the projects off of the Atlantic Coast.	
BOEM-2024-0001-0331-0015	The NJ/NY PEIS fails to take a hard look at the cumulative impacts of NY Bight combined with the other offshore wind projects that have been leased and are expected to be constructed nearby and the additional offshore wind energy facilities that are expected to be built along the Atlantic coastline. BOEM thus fails to analyze the combined impacts of the thousands of proposed offshore wind turbines covering millions of acres of pristine seabed and open ocean on the human and natural environment. By segmenting their offshore wind program and analyzing the environmental impacts of the New York Bight projects in isolation BOEM unlawfully fails to analyze and consider the cumulative environmental impacts of the other multiple offshore wind projects that BOEM has approved or is considering for approval. BOEM's failure to analyze the cumulative environmental impacts of its offshore wind program as NEPA requires is arbitrary capricious and not in accordance with law and should be invalidated and set aside. (U.S.C. 706.)	Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004.
BOEM-2024-0001-0331-0018	The total number of wind turbines planned along the Atlantic Coast is 3636 with over 15000 miles of cabling 180000 acres of seabed disturbance 4800 acres of scour protection. Many of these statistics for the Atlantic Coast totals EXCLUDE the New York Bight Area! New York Bight Draft Programmatic Environmental Impact Statement - Appendix D (boem.gov)	Please refer to response to comment BOEM-2024-0001-0331-0011. As described in PEIS Appendix D, Attachment D2, *Maximum-Case Scenario Estimates for Offshore Wind Projects*, there is an estimated total of 3,565 wind turbine generators. This number includes planned turbines for the NY Bight Wind Energy Area.
BOEM-2024-0001-0350-0002	Upon analyzing the draft PEIS it is CFACT's position that The Bureau of Ocean Energy Management's (BOEM) first multi-site offshore wind PEIS is derisory and laughable. After numerous requests going back several years the BOEM has finally published a draft PEIS for a combination of coming offshore wind projects. In this case the PEIS is	The PEIS considers potential impacts from the full buildout of the NY Bight lease area under the “Impacts of Six Projects” analysis for Alternative B and Alternative C under each resource area considered.

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	for a cluster of six large projects in what is called the New York Bight. In principle this PEIS should identify and assess those impacts that arise from the combination of projects over and above the individual project impacts. In fact it does nothing of the sort and the result is simply ridiculous. Most of the approximate 800 pages are merely an academic discussion of the general environment listing the kinds of impacts that might or might not occur and what may or may not be done about said impacts. There is basically no discussion at all about this specific combination of projects presented in the PEIS.	BOEM notes that this PEIS does not approve any projects in the NY Bight lease areas. During project-specific COP NEPA reviews for the NY Bight lease areas, BOEM would analyze each project's impact on the environment using the specific details of the proposed project; the analysis would also include cumulative effects of other offshore wind projects.
BOEM-2024-0001-0352-0011	In the context of the cumulative impacts analysis the final PEIS should update the list of ongoing vs. planned offshore wind projects to account for all COPs that have been approved by the time the PEIS is finalized. For example the draft PEIS lists the commercial scale Coastal Virginia Offshore Wind project as "planned." This should be corrected to "ongoing" in the final PEIS.	Thank you for your comment. The Final PEIS has been updated as appropriate to reflect changes to projects included in the cumulative impact analysis.
BOEM-2024-0001-0354-0004	Meaning no respect to any one BOEM official or employee I communicated the above referenced comment in order to underscore the urgent and absolute need to engage in a thorough review of the cumulative and [Underline: indirect impacts] (emphasis added) as to the currently proposed New York Bight various projects in conjunction with the previously approved and proposed past industrial projects already in various stages of implementation and construction off our coast. There are currently contemplated 900+ gigantic industrial wind turbines to be located off the valuable precious and irreplaceable New Jersey coastline. It is entirely arbitrary and capricious and environmentally unsound 'to attempt to segregate out allegedly separate and distinct wind turbine projects in this inter-related and interdependent section of the Atlantic Ocean. Though BOEM has taken one small step to recognize the above referenced point by combining six (6) wind turbine lease sites together such an action is still far too narrow and arbitrary. The pending Draft Environmental Impact review must include the inter-related and critical review of the _cumulative and [Underline: indirect impacts] (emphasis added) of all the other sites at the very least off the New Jersey/New York and Mid Atlantic coastline.	Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004.

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BOEM-2024-0001-0354-0006	As I have argued in testimony at the previously conducted BOEM hearings with respect to such inter-related lease sites it is entirely inappropriate and lacking in scientific support to limit and to separate out the review of such individual massive industrial projects off our coast without a full consideration of the overall cumulative and indirect impacts on the leasing of greater than 500000 acres of the entire Atlantic Ocean eco system. The cumulative impacts upon such an invaluable public resource in the form of the Atlantic Ocean are arbitrarily being discounted if not ignored by the ongoing all too limited bifurcating process. Migratory birds valuable commercial and recreational fisheries marine mammals ocean life and our precious ocean environment itself all deserve accumulative scientifically supportable overall review process: To carve out separate artificially drawn piece meal project sites is contrived inappropriate and unsupportable.. In fact proceeding in this manner underscores the very definition of arbitrary and capricious. The offshore expanse of the New Jersey Coast_ is one magnificent portion of our Atlantic Ocean and should not be carved up with artificially _drawn - manmade profit driven bureaucratic boundaries for individual though still massive industrial construction sites. Our ocean happens to be one of the richest most valuable environmental and economic treasures in the world. The critically endangered North Atlantic Right Whale and some of the other inhabitants of our Atlantic Ocean fisheries truly do not recognize any fabricated non-scientific boundaries. The cumulative effects and indirect impacts of the currently projected eleven (11) other projects with massive turbines off our coast have been virtually discounted if not ignored.	Please refer to response to comment BOEM-2024-0001-0331-0011.
BOEM-2024-0001-0354-0007	As such I would reject the current procedures and limited approach to fabricate and to segregate out one particular focus for a Draft Environmental Impact Statement. A cumulative scientific review is warranted. The study of the cumulative and indirect impacts of the areas of other pending projects off the New Jersey Coast and the construction of over nine hundred (900) massive turbines is absolutely necessary rather than the far too limited sole review focus of the pending draft EIS as to the "NY Bight". Absent such an overall study with a thorough review of the cumulative and indirect impacts the current proposal must be seen as arbitrary and capricious. As I	Please refer to response to comment BOEM-2024-0001-0319-0001 for a description of how projects are determined to be reasonably foreseeable and included in cumulative impacts analysis.

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	had also previously argued in various BOEM created forums as to the premature award of leases and otherwise the .above referenced exhaustive and cumulative study is essential. This critically necessary BOEM study should involve a complete review of the cumulative and indirect impacts with all the vast areas of public lands off the New Jersey Coast which have already been sold off yet have similarly not yet been fully authorized and certainly not developed. Similarly the same cumulative and indirect comprehensive review process must be applied as to all pending and approved projects and their too limited Environmental Impact Statements.	
BOEM-2024-0001-0354-0008	All these numerous overall Atlantic Ocean impacts should initially be thoroughly investigated before such a totally unvetted experimental technology is the subject matter of what are tantamount to be irreversible actions. Included in such a non exhaustive list of the potential impacts to be first thoroughly reviewed and studied as to the specific "NY Bight" Project itself as well as from a cumulative standpoint all the other Ocean sites at various stages of wind turbine construction certainly should be the following: 1. A vital habitat for birds fish and marine mammals both in the water as well as throughout the wetlands and other coastal areas of our State. 2. Commercial fishery sites as well as the interests of recreational fishing. 3. Air quality and water quality and the specific effects such a massive industrial construction project itself would have as well as the on going operation of the vast wind turbines and the ultimate not even explained process of trying to decommission or dismantle this huge industrial construction once ifs useful life has ended or it has been rendered obsolete by the already ongoing development of more efficient technologies. 4. Issues of environmental standing and environmental justice as to the Atlantic Ocean itself and the ocean environment. 5. The cumulative effect upon navigation and ocean vessel traffic in this busy commercial corridor which is already the subject matter of numerous potentially conflicting uses. 6. The interests of recreation and tourism.	The PEIS analyzes the potential impacts of the action alternatives individually and cumulatively with all reasonably foreseeable future planned activities, including future offshore wind projects. An analysis of impacts on the resources identified by the commenter can be found in the following sections of the PEIS: Section 3.5.3, *Birds*; Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*; Section 3.5.6, *Marine Mammals*; Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*; Section 2.4.1, *Air Quality*; Section 3.4.2, *Water Quality*; Section 3.6.4, *Environmental Justice*; Section 3.6.6, *Navigation and Vessel Traffic*; Section 3.6.8, *Recreation and Tourism*; and Section 3.6.9, *Visual Resources*.

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	7. The visual effects and indeed visual resources of the coastal and the ocean setting in the vicinity of this massive industrial site. 8. Independent of the overall effects upon mammals marine and- bird wildlife this_gigantic untested industrial construction project has the potential for causing a devasting impact upon threatened endangered species including the extremely endangered North Atlantic Right Whale. The Right Whale frequents this very ocean area in question and may indeed be crowded out and pushed aside from some of the already leased ocean lands subject to the prior rapid bidding process and awards through BOEM. The undersigned hereby strenuously would argue that to limit this Draft Environmental Impact Statement and the accompanying review without consideration of the cumulative and indirect impacts must be deemed arbitrary and capricious.	
BOEM-2024-0001-0354-0009	POINT Ill BOEM should enter a "no action alternative" and thereby implement a pause and moratorium of the entire leasing process as to the New York Bight and as to other lease sites proposed off the New Jersey shore until such time as the above referenced thorough study of the cumulative impact of previously awarded wind turbine leases has been undertaken.	Please refer to response to comment BOEM-2024-0001-0309-0004.
BOEM-2024-0001-0354-0014	As previously argued herein BOEM has taken a first step in an overall comprehensive review of this project upon the entire Atlantic Ocean ecosystem its wealth of natural resources along with the potential impacts upon commercial and recreational fishing tourism and/or quality of life for residents and businesses along the entire New Jersey shore. By such a comment I am referring to the fact that for the first time BOEM has now incorporated in its review process six (6) lease sites in relatively close geographic proximity. Nevertheless BOEM should go much further than such an approach as previously argued herein. As such I would suggest that the record as to this draft Environmental Impact Statement include fully developed records of Environmental Impact Statements already in existence with BOEM as to the clearly interrelated previously approved sites of wind turbine construction at other locations not just off the coast of New Jersey and New York but off the entire eastern seaboard. Not the least of relevant aspects of this entire record for BOEM includes scientific opinions and testimony as to the Massachusetts approved	Please refer to responses to comments BOEM-2024-0001-0309-0004 and BOEM-2024-0001-0331-0011. Please refer to PEIS Section 3.5.6, *Marine Mammals*, for a discussion on cumulative impacts of the No Action and action alternatives on marine mammals, including the NARW. Please refer to PEIS Section 3.4.1, *Air Quality and Greenhouse Gas Emissions*, for a discussion on the impacts of the Proposed Action (Alternative C) on climate change.

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	wind turbine projects. On that record scientists already have indicated that if BOEM proceeds in approving the numbers of wind turbine projects currently proposed (not to mention additional such projects already being fast tracked before BOEM and otherwise) the North Atlantic Right Whale would be virtually condemned to extinction. Additionally the Environmental Impact Statement and any and all further documents press releases or statements from BOEM should already include BOEM's previously issued admission: "THERE WOULD BE NO COLLECTIVE IMPACT ON GLOBAL WARMING AS A RESULT OF OFFSHORE WIND PROJECTS".	
BOEM-2024-0001-0357-0003	First the BOEM does not consider the full real environmental impact to an area when it approves projects and	Please refer to the responses to comments BOEM-2024-0001-0309-0004 and BOEM-2024-0001-0331-0011.
BOEM-2024-0001-0357-0008	Neither this draft program EIS or any project specific EIS provides a cumulative assessment of the lasting effect from decommissioning of these projects which if removals are not done would leave hundreds of thousands of acres of now productive marine environment unusable for generations (See enclosure V).	Decommissioning is discussed in PEIS Section 2.1.2.1.3, *Conceptual Decommissioning.* Lessees can request that facilities remain in place in the decommissioning application submitted to BSEE (30 CFR 285.900-285.913), but BOEM approves or does not approve the request (30 CFR 585.434). Unless otherwise determined during the decommissioning application review, NY Bight lessees would be required to remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seabed of all obstructions created. Lessees would be required to submit a decommissioning application to BSEE upon the earliest of the following dates: 2 years before the expiration of the lease, 90 days after completion of the commercial activities on the commercial lease, or 90 days after cancellation, relinquishment, or other termination of the lease (30 CFR 285.905).
BOEM-2024-0001-0357-0009	Neither this draft program EIS or any project specific EIS presents a cumulative assessment of all these projects on the cold pool and therefore no AMMM measures to mitigate that cumulative impact (See Enclosure VI).	Cumulative impacts on the Mid-Atlantic Bight Cold Pool are discussed in PEIS Section 3.4.2, *Water Quality*.
BOEM-2024-0001-0357-0012	This program EIS does not provide that cumulative look. The Notice of Intent states for the EIS states that one of the Program EIS objectives is to provide for [Bold: "focused regional cumulative analysis"]. But then it says that its AMMM measures will apply to	Please refer to response to comment BOEM-2024-0001-0357-0029. For each resource considered, the PEIS analyzes the impacts of a single representative NY Bight project, the impacts of a full

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	development in the whole New York Bight area but not necessarily to BOEM's program outside of the New York Bight area even though the impacts of the New Jersey area projects contribute significantly to those cumulative impacts. This is a contradiction and the BOEM cannot have it both ways. Additionally and even more importantly the EIS does not count up cumulative impacts at all but just lists the projects as individual entities. As shown above there are significant cumulative impacts from development in both the New York Bight area and the New Jersey wind energy area. The draft program EIS also misleadingly states that: "This Draft Programmatic Environmental Impact Statement (PEIS) assesses the potential biological socioeconomic physical and cultural impacts that could result from development activities for six commercial wind energy leases in an area offshore New Jersey and New York known as the New York Bight (NY Bight) as well as the change in those impacts that could result from adopting programmatic avoidance minimization mitigation and monitoring (AMMM) measures. The six commercial leases analyzed in this Draft PEIS are OCS-A 0537 0538 0539 0541 0542 and 0544 (hereafter referred to as the NY Bight leases or lease areas) totaling over 488000 acres (197486 hectares) (Figure ES-1) which were issued by the Bureau of Ocean Energy Management (BOEM) on May 1 2022". But the draft program EIS does not provide that cumulative impact assessment at all. It still treats each project in isolation. Substantively in continuing to do so the BOEM plays a dangerous shell game with the lives of marine mammals and commercial and military vessel crews. For example by treating projects in isolation it always assumes that a migrating whale has somewhere else safe to go. But when the projects are looked at collectively as shown in Enclosure II they do not. The same is true for the safety of commercial and military vessel crews as shown in Enclosure III. The BOEM's and Marine Fisheries stubborn refusal to look at impacts collectively and cumulatively in its decision-making is therefore not only irrational arbitrary and capricious but destructive. And because of that it also cannot identify the proper more substantive AMMM measures that should be considered here (see Enclosure I). By failing to look at the total real impact the BOEM decision-making exercise itself is fatally flawed. Because of the	buildout of six NY Bight projects, and the cumulative impacts of offshore wind development in the NY Bight in combination with other ongoing and reasonably foreseeable activities, including offshore wind activities. BOEM intends for the analysis of one project to be used for tiering and incorporation by reference at the COP-specific NEPA stage, including providing context that can be used in COP-specific NEPA analyses and against which proposed actions at the COP-specific stage may be compared.

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	interconnections between the projects in the NJ/NY area no serious decision maker can make rational reasoned decisions on any of these projects without benefit of a thorough quantitative if possible cumulative impact assessment of all the projects and based on that full real impact (not the fictitious impact of a single project) consider terminating or significantly changing particular projects to make that real full impact acceptable. If the BOEM chooses not to do that analysis in this program EIS then it must do so in every project specific EIS. If it does neither then it continues to engage in unreasonable decision-making.	
BOEM-2024-0001-0357-0013	To correct these flaws the scope of this program EIS or its project-specific EISs needs to expand to: - first include all projects in the same geographical area i.e. the New Jersey wind energy area projects and the NY Bight projects - next to present the cumulative impact of all the those projects in the NJ/NY areas and then finally - to treat all of these projects not as isolated fiefdoms but as variables that can be terminated or significantly changed to make that real full cumulative impact (not the fictitious impact of a single project) acceptable.	Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004.
BOEM-2024-0001-0357-0026	Conclusions The BOEM is engaged in an inherently illogical and unreasonable decision-making process. The scope of this program EIS or its project-specific EISs should be expanded to include the New Jersey wind energy area present the cumulative impacts of all the projects in the NJ/NY area and as needed present options to terminate or significantly alter one or more projects to make the real total cumulative impact-not the fictitious impact of one project-acceptable. We expect that the BOEM will not change the scope off its EISs as we have suggested. It will likely maintain that it does not have construction and operations plans for all the projects so it cannot reasonably foresee their impacts. But this is a poor excuse because it can apparently see those impacts clearly enough to present AMMM measures for them. If some additional time is required to analyze a particular critical impact for one or more projects then decisions on all the projects in the area should be delayed to do that. No substantive benefit from these projects has been identified warranting making a decision that could have	Please refer to response to comment BOEM-2024-0001-0319-0001 for a description of how projects are determined to be reasonably foreseeable and included in cumulative impacts analysis. BOEM notes that this PEIS does not approve any projects in the NY Bight lease areas. During project-specific COP NEPA reviews for the NY Bight lease areas, BOEM would analyze each project's impact on the environment using the specific details of the proposed project; the analysis would also include cumulative effects of other offshore wind projects.

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	disastrous consequences on the shore and marine life without that essential information.	
BOEM-2024-0001-0357-0028	Toward that end: 1.The scope of the EIS should be expanded to include projects in the New Jersey wind energy area now defined by lease areas OCS A0498 0532 A0499 and A-0549. Such an expansion is warranted for two reasons; to address cumulative impacts and as a matter of proper program definition.	Please refer to response to comment BOEM-2024-0001-0319-0001 for a description of how projects are determined to be reasonably foreseeable and included in cumulative impacts analysis. Separate NEPA reviews have either been completed or are currently underway for the lease areas mentioned in the comment, with the exception of OCS-A 0532 (Ocean Wind 2) because the lessee has ceased development of the lease area. Cumulative impacts are addressed in the NEPA documents for the other three lease areas.
BOEM-2024-0001-0357-0029	Regarding the first the Notice of Intent states that one of the PEIS objectives is to provide for "focused regional cumulative analysis". But then it says that its avoidance minimization mitigation and monitoring measures (AMMM) measures will apply to development in the whole New York Bight area but not necessarily to BOEM's program outside of the New York Bight area. This is a contradiction and the BOEM cannot have it both ways. There are significant cumulative impacts from development in both the New York Bight area and the New Jersey wind energy area and to assess those the scope of the PEIS must be expanded to include the New Jersey wind energy area. It is required that common and cumulative impacts be addressed in one place. The Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) rule 1502.4(b)(1) i says that when preparing statements on programmatic actions (including proposals by more than one agency) agencies may find it useful to evaluate the proposals "geographically including actions occurring in the same general location such as body of water region or metropolitan area". Here there are such geographical areas that will be impacted by development in both the Hudson South and the New Jersey wind energy area. Further regarding such cumulative impacts in the CEQ rulemaking of April 20 2020 the Biden Administration re-instituted the definition of cumulative effects in 1508.1(g)(3). That definition now states that cumulative impacts are "effects on the environment that result from the incremental effects of the action when added to the effects of other past present and reasonably foreseeable actions regardless of what agency (federal or non-	Please refer to responses to comments BOEM-2024-0001-0319-0001 and BOEM-2024-0001-0357-0028. The cumulative impacts of increased vessel traffic from the Proposed Action (Alternative C) in combination with reasonably foreseeable planned activities on marine mammals are discussed in Section 3.5.6, *Marine Mammals*.

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	federal) or person undertakes such other actions". The actions underway by the BOEM in both the Hudson South area and in the New Jersey wind energy area are incremental in terms of certain important impacts as summarized below and explained in detail in the Enclosures here are clearly underway and therefore reasonably foreseeable. Therefore this EIS must include the impacts of all those actions. A number of those cumulative impacts are presented here for illustration. They include: (1) the impact of operational turbine noise from both areas on the primary migration corridor of the North Atlantic right whale which lies between the two areas (2) the impact of vessel surveys using high intensity noise equipment for projects in both the New York Bight and the New Jersey wind energy area acting in the same geographical area concurrently (3) the impact on migratory birds that must cross both areas to get to nesting grounds (4) the impact on the cold pool which spans both the New Jersey and the New York Bight areas (5) the impact of decommissioning including vessel activity and onshore facilities and (6) the socio-economic impact from higher electric rates that will result from development in both areas. In addition the cumulative impact of vessel strikes and construction noise on the North Atlantic right whale needs to be addressed in the PEIS. As mentioned in the Notice of Intent the development of effective AMMM measures must consider cumulative impact. Therefore the scope of the proposed EIS must be expanded to include development in the New Jersey wind energy area now defined by lease areas A0498 A-0532 A0499 and A-0549 in order to do that.	
BOEM-2024-0001-0357-0031	The scope of the EIS should be expanded to consider the cumulative impact of all the proposed projects in the New Jersey New York area. The Notice of Intent states that one of the PEIS objectives is to provide for "focused regional cumulative analysis". But then it says that its AMMM measures will apply to development in the whole New York Bight area but not necessarily to BOEM's program outside of the New York Bight area. This is a contradiction and the BOEM cannot have it both ways. Additionally an even more importantly the EIS does not count up cumulative impacts at all but just lists the projects as individual entities. As shown below there are significant cumulative impacts from development in both the New York Bight	Please refer to response to comment BOEM-2024-0001-0319-0001 and BOEM-2024-0001-0357-0028.

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	area and the New Jersey wind energy area to assess those the scope of the PEIS must be expanded to include in New Jersey Wind Energy Area and to do a real cumulative impact analysis.	
BOEM-2024-0001-0357-0033	The PEIS should include more substantive programmatic avoidance minimization mitigation and monitoring (AMMM) measures. A leasee is required to conduct activities in compliance with all applicable environmental laws and rules including the Endangered Species Act (ESA) the Marine Mammal Protection Act (MMPA) the National Historic Preservation Act (NHPA) and the Coastal Zone Management Act (CZMA).NEPA rule 1508.1(s) requires that mitigation measures include:(1) avoiding the impact altogether by not taking a certain action or parts of an action and (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation. In addition 30 CFR 585.105(a) requires a lessee to "Design your projects and conduct all activities in a manner that ensures safety and will not cause undue harm or damage to natural resources including their physical atmospheric and biological components" and 30 CFR 585.801(f) (1) requires the submission by the lease of "Measures designed to avoid or minimize adverse effects and any potential incidental take of the endangered or threatened species or marine mammals". Therefore the scope of the EIS should be adjusted to include the New Jersey wind energy area consider the cumulative impacts of projects and where needed terminate or significantly alter one or more projects to make the real total cumulative impact acceptable.	In response to comments on the PEIS, BOEM reviewed all AMMM measures and grouped them into AMMM measures that have been terms and conditions of previous COP approvals, measures that have not been terms and conditions of previous COP approvals, and RPs. The project-specific COP NEPA review will also review AMMM measures and may include new or different AMMM measures that are specific to the project. Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004 regarding the scope of the cumulative impacts.
BOEM-2024-0001-0425-0005	As previously argued herein BOEM has taken a first step in an overall comprehensive review of this project upon the entire Atlantic Ocean ecosystem its wealth of natural resources along with the potential impacts upon commercial and recreational fishing tourism and/or quality of life for residents and businesses along the entire New Jersey shore. By such a comment I am referring to the fact that for the first time BOEM has now incorporated in its review process six (6) lease sites in relatively close geographic proximity. Nevertheless BOEM should go much further than such an approach as previously argued herein. As such I would suggest that the record as to this draft Environmental Impact Statement include fully developed records of Environmental Impact Statements already in existence	Please refer to response to comment BOEM-2024-0001-0354-0014.

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	with BOEM as to the clearly interrelated previously approved sites of wind turbine construction at other locations not just off the coast of New Jersey and New York but off the entire eastern seaboard. Not the least of relevant aspects of this entire record for BOEM includes scientific opinions and testimony as to the Massachusetts approved wind turbine projects. On that record scientists already have indicated that if BOEM proceeds in approving the numbers of wind turbine projects currently proposed (not to mention additional such projects already being fast tracked before BOEM and otherwise) the North Atlantic Right Whale would be virtually condemned to extinction. Additionally the Environmental Impact Statement and any and all further documents press releases or statements from BOEM should already include BOEM's previously issued admission: [Bold: "THERE WOULD BE NO COLLECTIVE IMPACT ON GLOBAL WARMING AS A RESULT OF OFFSHORE WIND PROJECTS".]	
BOEM-2024-0001-0532-0002	Cumulative impacts Analysis and Alternatives: BOEM should provide clarity on assumptions made within its Cumulative impacts Analysis regarding simultaneous construction and broaden its definition of reasonably foreseeable actions in the PEIS.	Please refer to the response to comment BOEM-2024-0001-0319-0001.
BOEM-2024-0001-0450-0003	The need for Sufficient Data: BOEM must obtain and disclose all relevant Data acknowledge Data gaps and evaluate impacts using accepted scientific methods while being cautious about making broad determinations without Sufficient data. Additionally BOEM should include further monitoring and adaptive management recommendations.	BOEM addresses the concern of data gaps and unavailable information, as required under CEQ regulations (40 CFR 1502.21), in PEIS Appendix E: *Analysis of Incomplete and Unavailable Information*. In accordance with 40 CFR 1502.21, when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS and when information is incomplete or unavailable, the agency shall make clear that such information is lacking and determine if any incomplete information is essential to a reasoned choice among alternatives. BOEM has done so in the PEIS in Appendix E. A description of mitigation and monitoring measures considered in the PEIS is provided in Appendix G, *Mitigation and Monitoring*.
BOEM-2024-0001-0450-0010	Cumulative Impacts Analysis and Alternatives The purpose of a PEIS is to provide a "[f]ocused regional cumulative analysis[]"[Footnote 21: 87 FR at 42496.] and the Council for Environmental Quality has clarified that under NEPA agencies must consider direct indirect and cumulative effects of major federal actions. [Footnote 22: 40 CFR 1508.1(g) 87 Fed. Reg. 23453 23469-70 (Apr. 20 2022).] Under 40	Please refer to response to comment BOEM-2024-0001-0319-0001 for a description of how projects are determined to be reasonably foreseeable and included in the cumulative impacts analysis. The PEIS analysis assumes construction of all six projects would occur simultaneously. Where impact levels would change if

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	C.F.R. 1508.1(g)(3) "cumulative effects" has the following definition: Cumulative effects which are effects on the environment that result from the incremental effects of the action when added to the effects of other past present and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. In addition to a thorough examination of direct and indirect impacts as well as mitigation measures assessing cumulative effects is essential to understanding the overall impact of offshore wind on species and ecosystems along the coast and in the NY Bight. This PEIS presents an opportunity to look comprehensively at regionwide cumulative impacts before site-specific proposals are considered providing BOEM and other stakeholders with enhanced understanding of how various project designs may affect resources in the area. Consideration of cumulative impacts at a regional scale if done properly can ensure detailed analysis of impacts such as the region-wide effects of noise on wildlife populations the impacts of construction timing benefits offered by various alternatives like the use of quiet foundations and the design of sufficiently protective AMMM measures. The Draft PEIS states that: "This Draft PEIS assesses the impacts from both a single representative project that could be developed within any one of the NY Bight lease areas and from the totality of six projects within the NY Bight lease areas." [Footnote 23: Draft PEIS at 1-10.] The Draft PEIS also states that other past present and reasonably foreseeable impacts will be examined as part of the cumulative impacts analysis such as other offshore wind energy development activities global climate change and fisheries use management and monitoring surveys. [Footnote 24: Draft PEIS at 1-10. Appendix D Planned Activities Scenario] While the impacts listed are comprehensive the Draft PEIS is not clear whether it contemplates the construction of all six projects simultaneously which could result in impacts of greater significance than anticipated by this document. The Draft PEIS also states that "For purposes of analysis this PEIS assumes that full buildout of one NY Bight lease area is the same as one NY Bight project. While lessees may elect a phased development approach resulting in more	construction were to occur in a phased approach, the PEIS analysis identifies the change in impact level. While lessees may elect a phased development approach resulting in more than one project per lease, for purposes of analysis, this PEIS assumes one project per lease area. If selected, the phased development approach would be analyzed in COP-specific NEPA analysis.

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	than one project per lease area this PEIS analyzes the most conservative development scenario that could occur per lease area." [Footnote 25: Id.] If development scenarios arise that involve more than one project per lease area this will need to be examined not only on a site-specific basis but as part of a cumulative impacts analysis that accounts for this unexamined development. Further BOEM should consider development in potential leases within the Gulf of Maine Draft Wind Energy Area[Footnote 26: BOEM Releases Draft Wind Energy Area in the Gulf of Maine for Public Review and Comment. October 19 2023. https://www.boem.gov/newsroom/press-releases/boem-releases-draft-wind-energy-area-gulf-maine-public-review-and- comment] and Central Atlantic Final Wind Energy Areas[Footnote 27:BOEM Finalizes Wind Energy Areas in the Central Atlantic. July 31 2023. https://www.boem.gov/newsroom/press- releases/boem-finalizes-wind-energy-areas-central-atlantic] as "reasonably foreseeable" actions to include in the PEIS. "Reasonably foreseeable means sufficiently likely to occur such that a person of ordinary prudence would take it into account in reaching a decision." 40 C.F.R. 1508.1(aa). Historically BOEM has not incorporated unleased areas into its Planned Activities Scenario. However wind energy development in the Gulf of Maine and Central Atlantic is reasonably foreseeable to occur during the construction and operations stages of the NY Bight offshore wind projects. BOEM recently finalized WEAs in the Central Atlantic and issued a Proposed Sale Notice[Footnote 28: 88 FR 86145] for that area two steps which immediately proceed leasing. Additionally the Biden Administration has stated its goal to hold an offshore lease sale in the Central Atlantic and Gulf of Maine in 2024. [Footnote 29: BOEM Offshore Wind Leasing Path Forward. October 2021. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/OSW-Proposed-Leasing-Schedule.pdf https://www.reuters.com/business/energy/us-says-complete-offshore-wind-auctions-schedule-next-year-2023-09-25/] Wind energy development in the Gulf of Maine and Central Atlantic should therefore be accounted for in the PEIS. BOEM should not wait to analyze areas within the Planned Activities Scenario which the	

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	administration has said it is likely to lease or it will lead to a piecemeal insufficient analysis. [Footnote 30: It is well settled law that an agency may not "divid[e] a project into multiple actions" to avoid finding its effects significant Native Ecosystems Council v. Dombeck 304 F.3d 886 894 (9th Cir. 2002). Agencies therefore must consider related actions in a single NEPA document. Thomas v. Peterson 753 F.2d 754 758 (9th Cir. 1985) (citation omitted) see also Kleppe v. Sierra Club 427 U.S. 390 410 (1976) (finding that related actions that will have cumulative or synergistic environmental impact upon a region should be considered together under NEPA).] A broader geographic scope is needed to ensure a more holistic review of environmental impacts stemming from leasing in the New York Bight and a broader ecological perspective of the cumulative impacts on the Atlantic Coast.	
BOEM-2024-0001-0453-0001	We believe BOEM and the Administration must follow the same environmental studies and analysis and the same sequence that it uses when doing a similar environmental review for fishing related activities. This includes cumulative impacts that will be finalized at the onset prior to leasing as well as into the future. This should encompass the entire coastal waters that can be impacted by Offshore Wind Energy Development. To do otherwise will not be a credible study. Nor will the present process capture and research fundamental data gaps. Disregarding this lack of knowledge could lead to significant harm to our coastal ecosystem and the ecological services rendered to sustain the health and productivity of the coastal waters. Additionally it could undermine the socioeconomic welfare and cultural heritage of our coastal communities.	Please refer to response to comment BOEM-2024-0001-0309-0004. The cumulative impacts analysis of the anticipated development in the six NY Bight lease areas on fisheries and socioeconomics can be found in Section 3.6.1, *Commercial Fisheries and For-Hire Recreational Fishing*, and Section 3.6.3, *Demographics, Employment, and Economics*. See response to comment BOEM-2024-0001-0450-0003 regarding data gaps.
BOEM-2024-0001-0470-0004	The amounts of installed capacity and number of Wind Turbine Generators (WTGs) in the planned projects as described in the PEIS are inconsistent and seriously misleading:--On page ES-4 the PEIS states "Based on a conservatively estimated power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to create up to 5.6 to 7 GW of offshore wind energy."--On the same page the PEIS states an estimated 1618 GW of offshore wind energy may be necessary to ensure New York State achieves its Climate Act mandates (New York State Climate Action Council 2022).--On page	Section 3.4.1.3.2, *Cumulative Impacts of the No Action Alternative*, for air quality considers the impacts of the No Action Alternative in combination with other planned non-offshore-wind activities and planned offshore wind activities (without the six NY Bight projects). The 713 WTGs considered in the text excerpt highlighted by the commenter are from the following ongoing or planned offshore wind projects: Ocean Wind 1 (OCS-A 0498), Ocean Wind 2 (OCS-A 0532), Atlantic Shores North (OCS-A 0549), Atlantic Shores South (OCS-A 0499), Empire Wind 1 (OCS-A 0512), and Empire Wind 2 (OCS-A 0512). Note that the Final PEIS has

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	ES-7 of the PEIS BOEM states that "For the analysis of six NY Bight projects BOEM anticipates development of 1103 WTGs 22 offshore substations (OSSs) 44 offshore export cables totaling 1772 miles (2852 kilometers) and 1582 miles (2546 kilometers) of inter-array cables across the six NY Bight lease areas."---This assertion that the six NY Bight projects would build "up to 1103 WTGS" is repeated on PEIS page 2-16.--On page 3.4.1-8 the PEIS says the NY Bight Projects evaluated in the PEIS would construct an estimated 9922 MW of renewable power from the installation of 713 WTGs citing Table D2-1 in Appendix D.---Table D2-1 indicates only 8822 MW will be installed by the current projects and require 615 WTGs---Table D2-1 further indicates that a further 1103 WTGs are planned but fails to disclose the resulting installed MWs. (Using a ratio analysis of the data provided in Table D2-1 if 615 WTGs will produce 8822 MW of installed capacity then 1103 WTGs would constitute anoth- er 15822 MW installed).--The Table in Appendix D appears to conflict with text elsewhere in the PEIS and indicates the total planned buildout of OSW in the NY Bight leases is 26644 MW.	been updated with the most recent ongoing and planned offshore wind information for the Atlantic OCS, and all tables have been updated in Final PEIS Appendix D. The 713 WTGs and 9,992 MW cited in the Draft PEIS has been updated to 697 WTGs and 9,561 MW in the Final PEIS. As described in Appendix D, Table D2-1 and Table 2-2, the six NY Bight projects would build up to 1,103 WTGs.
BOEM-2024-0001-0470-0006	Inconsistent and misleading depictions of actual and planned WTG/MW in and among the main PEIS text and appendix information demonstrates project segmentation. [Underline: Appendix D: Planned Activities Scenario] of the PEIS contains summary tables that indicate the total number of "foundations" to be built for either WTGs or offshore substations (OSSs) (PEIS Table D-2) and the total number of WTGs (PEIS Table D2-1) as of November 2023. PEIS Table D2 reveals construction planning for a total of 1761 foundations in the NY Bight. PEIS Table D2-1 reveals that 1718 of the foundations are for WTGs to be constructed 615 (or 713) of which comprise the current proposed actions in the PEIS. The additional segmented projects wishfully intended to meet NY ratepayer service obligations while also complying with the CLCPA (discussed in further detail below) includes the additional 1103 WTG buildout. As excerpted in Table 1 PEIS Table D2-1 data shows that the projects comprising the Proposed Action will total 615 WTGs providing installed capacity of 8822 MW (contrasting with the 713 WTGs and 9922 figures provided on p. 2.4.1-8 of the PEIS). The undisclosed unanalyzed future projects in six other lease areas labeled as	Please refer to response to comment BOEM-2024-0001-0470-0004.

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	"planning" requiring the additional 1103 WTGs would be an increase of almost 200% over the current project total of 615. These "planned" leases and WTGs are due to begin construction between 2026 and 2030 with construction potentially extending beyond 2030.[Table 1: Summary of Current and Planned OSW Projects]Lease/Project: Atlantic Shores South; Lease Area: OCS-A 0499; Status: COP PPA SAP; Table D2-1 Turbine Number: 200; Generating Capacity (MW): 2837Lease/Project: NY/NJ Atlantic Shores North; Lease Area: OCS-A 0549; Status: COP PPA SAP; Table D2-1 Turbine Number: 157; Generating Capacity (MW): 2355Lease/Project: NY/NJ Ocean Wind 2; Lease Area: part of OCS-A 0532; Status: COP PPA SAP; Table D2-1 Turbine Number: 111; Generating Capacity (MW): 1554Lease/Project: NY/NJ Empire Wind 1; Lease Area part of OCS-A 0512; Status: COP PPA SAP; Table D2-1 Turbine Number: 57; Generating Capacity (MW): 816Lease/Project: NY/NJ Empire Wind 2; Lease Area: part of OCS-A 0512; Status: COP PPA SAP; Table D2-1 Turbine Number: 90; Generating Capacity (MW): 1260Lease/Project: NY Bight lease areas; Lease Area: OCS-A 0537 OCS-A 0538 OCS-A 0539 OCS-A 0541 OCS-A 0542 and OCS-A 0544; Status: COP PPA SAP; Table D2-1 Turbine Number: 1103; Generating Capacity (MW): Not Available[Table End]	
BOEM-2024-0001-0470-0007	[Bold: Source: PEIS Table D2-1]Table D2-1 in the PEIS claims the installed MW total for those additional WTGs is not available but arithmetic tells us that based on the current project figures depicted each WTG is expected to provide approximately 14.3 MW (8822 divided by 615). Multiplied against the planned 1103 additive turbines the installed capacity for the "future planned" additional projects is 15772 MW (15.7 GW) less than the estimated 16-18 additional GW needed to meet the CLCPA (assuming NY can claim all the electricity).The improper segmentation extends to energy storage goals established in both jurisdictions. Pursuant to revised energy storage deployment targets announced by NY Governor Kathy Hochul in January of 2022 that double storage capacity from 3 GW to 6 GW by 2030 NYSERDA submitted an updated "Storage Roadmap" to the NYS Public Service Commission (PUC) on December 28 2022. [Footnote 2: CASE 18-E-0130 In the Matter of Energy Storage Deployment Program December 28 2022] In the Roadmap	Because the analysis in this PEIS was conducted prior to the issuance of COPs for the NY Bight lease areas, energy production estimates were not included, as the final turbine size has not been selected. The RPDE was developed with input from the six NY Bight lessees, American Clean Power, National Renewable Energy Laboratory, and the States of New York and New Jersey. In general, the maximum values in the RPDE represent the maximum scenario of development that could occur in the NY Bight lease areas.

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	NYSERDA acknowledges "this nation-leading storage target is motivated by the rapid growth in renew- able energy expected over the next decade and the role that electrification of transportation and buildings is expected to play in achieving New York State's future carbon neutral economy" (Roadmap page 6).The PUC case filling further discloses NYSERDA's understanding that: To serve the needs of a carbon neutral economy analysis developed to support this Roadmap indicates that about 12 GW of energy storage by 2040 and 17+ GW by 2050 would be part of a cost-effective decarbonized electric grid offering critical benefits in terms of grid reliability and integration of renewable generation (Roadmap page 6).This 12-17 GW of storage appears to be parallel infrastructure/facility development needed on top of the Proposed Actions and the addition 16-18 GW of installed OSW planned by NYS but the PEIS fails to describe the unavoidable adverse impacts from this storage buildout. New Jersey has also set an energy storage goal of 2 GW by 2030 which the BPU is looking to implement through a series of incentives. As recently as August of 2023 the BPU was issuing [Underline: Requests for Information (RFIs) in its Storage Incentive Program (NJSIP)] in recognition that "[e]energy storage resources are critical to increasing the resilience of New Jersey's electric grid reducing carbon emissions and enabling New Jersey's transition to 100% clean energy. "In spite of the implicit and explicit obviousness of this energy storage facility buildout as an integral part of renewable generation buildout (particularly the large volume of planned OSW projects and programming) the PEIS improperly segments out any assessment of planned storage capacity needed by renew- able generation to meet forecast demand.[See original attachment for Table 2: NYISO Baseline Annual Energy Forecast (In GWh)]	
BOEM-2024-0001-0470-0008	[Italics: a) The Installed Capacity Requirements and Planning are Both Segmented and Misleading]The segmentation of projects is clearly evidenced at the outset by the misleading inconsistencies in the size and parameters of NY Bight lease and construction planning outlines above. The PEIS (p. 1-5) states that based on a conservatively applied power ratio of 3 megawatts per square kilometer BOEM estimates that full development of leases in this area has the potential to	Please refer to responses to comments BOEM-2024-0001-0470-0004 and BOEM-2024-0001-0470-0007.

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	create up to 5.6 to 7 GW of offshore wind ener- gy. Yet the PEIS alternatively states the projects will create 8822 MW or 9922 MW and will include an additional 1103 WTGs to ostensibly satisfy the intersecting and potentially contradictory or mutually exclusive statutory and policy renewable goals established by New York and New Jersey:-NJ: 11 GW of offshore wind energy generation by 2040-NY: 9.0 GW of offshore wind energy generation by 2035-NY: 33% of downstate electric generation from OSW by 2040The PEIS indicates that the 20 GW total of OSW for the two state mandates noted above must be augmented by an additional estimated 1618 GW of offshore wind energy to ensure New York State achieves its CPCLA mandates. Other than the reference noted above to an additional 1103 WTGs being "planned" no description analysis or impact disclosure regarding the buildout of [Bold: 16-18 more GW of OSW] needed to meet the NY requirements alone is provided in the PEIS. This gap is not readily ascertainable as the Proponents have failed to inform the public regarding the known electricity demand requirements identified forecasts and trends (see data and discussion below).	
BOEM-2024-0001-0470-0014	[Underline: 2. Cumulative Impacts:] [Bold: The PEIS fails to identify and assess what are obvious and fore- seeable Cumulative Impacts from the deployment of OSW in the NY Bight All EISs must identify describe and analyze the direct indirect and cumulative effects of the action alternatives developed to implement the proposed action and the no action alternative. Cumulative effects are defined in 40 CFR Section 1508.1 as follows: Effects on the environment that result from the incremental effects of the action when added to the effects of other past present and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. In addition 43 CFR Section 46.30 defines "reasonably foreseeable future actions" to include "those federal and non-federal activities not yet undertaken but sufficiently likely to occur that a responsible official of ordinary prudence would take such activities into account in reaching a decision." The regulations further provide that the federal and non-federal activities BOEM must take into account in	Please refer to the responses to comments BOEM-2024-0001-0319-0001, BOEM-2024-0001-0309-0004, and BOEM-2024-0001-0331-0011. The CEQ NEPA Implementing Regulations require the impact analysis for NEPA documents to include cumulative effects, defined as the effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions.

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	the analysis of cumulative impacts include but are not limited to activities for which there are existing decisions funding or proposals identified by BOEM. Reasonably foreseeable planned actions do not include those actions that are highly speculative or indefinite. There is nothing speculative about the legal and policy mandates to build OSW in and near the NY Bight and other Atlantic Ocean regions to satisfy both renewable energy portfolio standards and electricity load demand. BOEM's own tables in Appendix D provide clear details as to the entire planned buildout in the NY Bight and those numbers clearly show 200% more WTGs than assessed for cumulative impacts in the PEIS. More importantly BOEM must assess the cumulative impacts of the WTG buildout actually needed to meet both the renewable mandates [bold: and] the known load growth forecasts. Therefore the PEIS must fully scope and evaluate all the OSW construction and operation needed and planned to complete the fully-scoped unsegmented Proposed Action: 33% of Downstate NY electricity produced by OSW in 2040 and beyond and compliance with NJ Executive Orders 307 and 315.Moreover the full cumulative impacts analysis must include the impacts of building the total NY and NJ energy storage capacity described in Section II.1.a of this submission.	
BOEM-2024-0001-0474-0007	Among other reasons the action is Arbitrary because the programmatic review fails to evaluate the cumulative impact of all offshore wind in the region.	Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004.
BOEM-2024-0001-0547-0004	Indeed the PEIS process by BOEM gives short shrift to the mitigation and analysis process of the offshore coasts and cumulative impacts by only providing summary estimates of impacts and providing no plans [Footnote 5: "Each lease holder is likely to submit at least one COA but it is not required. Emphasis added.] for any of the six NY Bight projects in opposition to its own acknowledgement of the cumulative impacts that this project will have combined with BOEM's other lease areas.	Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004. The potential change in impacts, including cumulative impacts, as the result of identifying AMMM measures is considered as part of the Alternative C analysis in this PEIS.
BOEM-2024-0001-0547-0006	The Council on Environmental Quality ("CEQ") and NEPA define cumulative impacts as "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." [Footnote 8: 40 C.F.R. 1508.7.] BOEM has acknowledged the cumulative effects of their offshore wind program	Please refer to responses to comments BOEM-2024-0001-0309-0004, BOEM-2024-0001-0331-0011, and BOEM-2024-0001-0319-0001. The CEQ NEPA Implementing Regulations require the impact analysis for NEPA documents to include cumulative effects,

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	going back to 2007 with their PEIS for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf. [Footnote 9: Bureau of Ocean Energy Management United States Department of the Interior Guide to the OCS Alternative Energy Final Programmatic Environmental Impact Statement https://www.boem.gov/ renewable-energy/guide-ocs-alternative-energy-final-programmatic- environmental-impact-statement-is.] With this PEIS for the NY Bight Project BOEM intends to provide a "baseline analysis that helps to satisfy the requirements of NEPA for offshore renewable energy leasing" [Footnote 10: Id; PEIS 2.1.1 at 2-2.] because "many wind energy projects will have similar environmental impacts." [Footnote 11: Id.] This PEIS does not satisfy NEPA's cumulative impacts requirement today because BOEM has significantly altered and expanded their offshore wind program not only over the years but even in the past nine months making the PEIS's "analysis of cumulative environmental impacts inaccurate and outdated and requiring a supplemental or new Environmental Impact Statement analyzing the current program as it now exists." [Footnote 12: Complaint Cape May v. U.S. Dept. of the Interior BOEM et al. No. 23-cv-21201 (D.N.J. Oct. 17 2023).] These are legitimate concerns that many longstanding and respected environmental groups have expressed. For example at the last virtual public hearing for the PEIS held on February 13 2024 the Nature Conservancy expressed concern about the lack of plans among other things. [Footnote 13: Public comments from the February 13 2024 virtual hearing for BOEM Docket No. 2024-0001 are pending.] This is a global environmental conservation group in existence for over 73 years. [Footnote 14: See Comments by The Nature Conservancy BOEM Hearing February 13 2024; see also Turbine Reefs Technical Report The Nature Conservancy November 2021 https://www.nature.org/content/dam/tnc/nature/en/documents/TurbineReefReport_Nature-BasedDesignsOffshoreWindStructures_Final2022.pdf (admitting knowledge and "informational gaps exist regarding documented benefits to marine environments where NBD has been implemented around offshore wind infrastructure" at 1.4).] So too did Clean Ocean Action publicly comment a 40-year old local New Jersey Shore	defined as the effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions. The Final PEIS has been updated as appropriate to reflect changes to projects included in the cumulative impact analysis.

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	organization advocating for the environment. [Footnote 15: Id. BOEM Public Hearing held on February 13 2024.] Why the rush? "Reduce Redundancies" and "Timely" are the hallmarks of the PEIS process to make it efficient and streamlined for the government but not for the environment or the public. [Footnote 16: See PEIS ES.2 at ES-3.] It comes off as political expediency and industrializing the oceans rather than saving the environment from harm. The truth is the clock is ticking for BOEM from the presumptive time limit of two years for completing the EIS in accordance with the CEQ implementing regulations effective May 20 2022. [Footnote 17: See PEIS at ES-2.] Rather than reasoned analysis BOEM's failure to analyze the cumulative environmental impacts of its offshore wind program is arbitrary and capricious and violates NEPA. [Footnote 18: 5 U.S.C. 706.]	
BOEM-2024-0001-0547-0008	Mitigation of the cumulative effects of the projects situated behind overlapping projects are not even shown in the PEIS [Footnote 22: See PEIS at 3.6.6-28.] in violation of NEPA. [Footnote 23: 42 U.S.C. 4332(2)(C) (NEPA further requires that the Environmental Impact Statement provide a "detailed statement . . . on . . . alternatives to the proposed action . . . .").] For example more studies are needed to show that the noise from the pile driving and sonar activities are not certainly confusing the mammals and leading to localized stranding such as the baby seal pup only days ago ending up a quarter mile from the ocean right in the middle of a commercial street nearby along the New Jersey Shore in Ocean City. [Footnote 24: "Rescued Gray Seal Pup from Ocean City Dies Despite Treatment Efforts Shore Local February 22 2024. https://shorelocalnews.com/rescued-grey-seal-pup-from-ocean-city-dies-despite-treatment-efforts/#:~:text=The%20Marine%20Mammal%20Stranding%20Centera%20mile%20down%2042nd%20Street . ("The Marine Mammal Stranding Center reported that the male grey seal pup rescued last week from the streets in Ocean City has died. The pup was s^tr^anded on February 7 after hauling out from the bay and traveling a quarter of a mile down 42nd Street.")] Appendix D shows old studies based on 2019 five years ago not considering the cumulative impacts of the additional BOEM lease sites thus nullifying the mitigation measures.	Please refer to response to comment BOEM-2024-0001-0309-0007.

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	[Footnote 25: See PEIS at D2-1.] One can only imagine the cumulative effects of thousands of vessel traffic [Footnote 26: See PEIS at 3.6.1.1.] and noise then layering the six lease projects in the NY Bight plus the additional BOEM lease areas all being worked on at once. The effects of which will result in not only thousands of "Takes" that BOEM estimated before the cumulative impacts of the NY Bight leases[Footnote 27: See BOEM 2023-0030.] likely only a starting number with additional EMFs sound noise and ill effects on humans as well. [Footnote 28: See NOAA-2024-00008 Jan. 5 2024 https://www.federalregister.gov/documents/2024/01/05/2024-00008/takes-of-marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to. Defend Brigantine Beach Inc. and Downbeach's research team prepared a comprehensive 34 page Public Comment to NOAA dated February 5 2024 regarding Atlantic Shores' new Take request to harass harm or injure more marine mammals with underground sound from their wind surveys discussing among other things the striking correlation between the more survey vessels there are the more whale deaths there are as a result at 9-11. See also PEIS at 3.5.2.2 et seq. and BOEM PEIS Docket No. 2023-0030.]	
BOEM-2024-0001-0547-0010	That there would be such dangerous environmental and health effects because of installation and operation of the Project as proposed - adding cumulative effects to the other BOEM leases starting only 9 miles offshore - shows that these projects' effects are not fully mitigated and not discussed by BOEM in the PEIS.	Please refer to responses to comments BOEM-2024-0001-0331-0011 and BOEM-2024-0001-0309-0004.

P.5.25 Programmatic Approach to Tiering

Table P.5-25. Responses to Comments on Programmatic Tiering

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BOEM-2024-0001-0346-0010	The Draft PEIS Should Set the Stage for Site-Specific Analyses to Grapple With the Difficult Issues Relating to the Protection of Fisheries and Fishing Grounds That Will Need To Be Considered Before Development Can Occur As explained above the Draft PEIS's commercial fisheries AAAMs do not go far enough to materially increase protection of fishing grounds from offshore wind	The M-Opinion cited concludes that “subsection 8(p)(4) of OCSLA imposes a general duty on the Secretary to act in a manner providing for the subsection’s enumerated goals. ...[S]he retains wide discretion to determine the appropriate balance between two or more goals that conflict or are otherwise in tension.” Neither the M-Opinion nor the Draft PEIS claims that the

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	development. While NEPA requires agencies to conduct analyses rather than achieve any particular outcome the Draft PEIS is not being conducted in a vacuum. Offshore wind development is not governed by NEPA alone but also by OCSLA which does impose substantive affirmative duties on agency decision-making relating to offshore renewable energy leasing and development. More specifically under the subsection entitled "Requirements" OCSLA mandates that "the Secretary shall ensure that any activity under this subsection is carried out in a manner that provides for (A) safety;(B) protection of the environment; (D) conservation of the natural resources of the outer Continental Shelf; and(I) prevention of interference with reasonable uses ." 43 U.S.C. 1337(p)(4). [Footnote 3: In M-Opinion 37067 this Administration's Interior Department Solicitor General construed 43 U.S.C. 1337(p)(4)'s list of secretarial obligations to confer essentially unchecked discretion on the Secretary of the Interior and this conclusion is referenced in the Draft PEIS. (1-7) However one example of the statutes on which M-Opinion 37067 was based is the Magnuson-Stevens Fishery Conservation and Management Act ("MSA"). The MSA has ten national standards. 16 U.S.C. 1851(a). While these standards may require balancing see Lovgren v. Locke 701 F.3d 5 32 (1st Cir. 2012) (cited in M-Opinion 37067 at 3) many courts have held that the Secretary of Commerce has violated one or more national standards in particular cases. See e.g. Southern Offshore Fishing Ass'n v. Daley 995 F. Supp. 1411 1437 n.35 (M.D. Fla. 1998). While the Secretary may have considerable discretion under Section 1337(p)(4) it is an over-statement to claim that discretion is essentially unlimited as the Draft PEIS does.] Protecting scallop beds and their continued productivity protects the environment and conserves natural resources. Establishing an offshore regime that allows for safe and orderly offshore wind development and commercial fishing provides for safety and prevents interference with reasonable uses. Ultimately the COPs that New York Bight windfarm developers will prepare will need to comply with OCSLA's affirmative requirements and site-specific EIS' s will need to support those COPs. The Draft PEIS aspires to be a document from which subsequent site-specific NEPA analyses can be tiered. The Draft PEIS should thus address the	Secretary has unfettered discretion. Her discretion is bounded by the language of OCSLA and a rule of reasonableness. Regarding the request to address fisheries impact minimization and pelagic habitat impact minimization, BOEM considered but did not analyze in detail a fisheries impact minimization alternative and a pelagic habitat impact minimization alternative, as described in Table 2-3 of Chapter 2. BOEM dismissed these as alternatives as it is analyzing several AMMM measures to minimize effects on these resources, including requirements for a Fisheries Compensation Plan and a Fisheries and Benthic Monitoring Plan, and because additional minimization measure or project-specific alternatives are more appropriate to evaluate during the COP-level NEPA review.

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	issues fisheries impact minimization and pelagic habitat impact minimization that OCSLA will require developers to address to prepare a legally defensible COP. Conversely BOEM's failure to recognize the intersection of NEPA and OCSLA requirements at this Draft PEIS stage will not be facilitating the development of site-specific analyses that will meet legal requirements.	
BOEM-2024-0001-0354-0003	POINT II The currently proposed bifurcated narrow review process of separating the six (6) New York Bight leases from the remaining lease sites off the New Jersey and New York coasts must be rejected in favor of a thorough scientific review of the cumulative and indirect impacts (emphasis added) as to the at least ten (10) other currently proposed wind turbine projects with 900+ additional turbines proposed to be constructed off the New Jersey coastline. I truly appreciate that BOEM's higher-up officials have seemingly agreed with my numerous past comments at least in part that a cumulative review process should be conducted as to all the closely inter-related sites for wind turbines off the New Jersey coast. As such BOEM has by inference agreed with my position in that BOEM has now combined the six (6) New York Bight wind turbine lease sites into one overall draft environmental impact statement. While such a stance is preferable to the previously implemented entirely arbitrary process of reviewing each nearby lease site separately such an approach does not go far enough.	The purpose of the PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. The analysis within Alternatives B and C of the overall impacts of a full buildout of six projects in the NY Bight lease areas evaluated comprehensive cumulative impacts by examining offshore wind activities within the NY Bight region as a whole. Cumulative impacts for each resource were analyzed and are discussed in each Chapter 3 resource section. The cumulative impact analysis considers the impact of the No Action Alternative and Alternatives B and C in combination with other ongoing and planned non-offshore-wind activities and offshore wind activities. The ongoing and planned offshore wind activities considered in the cumulative impacts analysis includes other proposed projects off the New Jersey and New York coast. The ongoing and planned offshore wind activities and the planned non-offshore-wind activities that may affect resources are discussed in Appendix D. BOEM has already initiated or completed COP-specific NEPA review for several projects off of the New Jersey shore (Ocean Wind 1, Atlantic Shores South, and Atlantic Shores North); therefore, it is inappropriate to delay those projects to incorporate them into the NY Bight PEIS as doing so would jeopardize the financial viability of those projects. BOEM included the six NY Bight leases in the PEIS because the leases are close to one another and were all leased at the same time, allowing BOEM to initiate the PEIS well in advance of the COP-level NEPA review.
BOEM-2024-0001-0354-0010	With particular emphasis on the lease already awarded to the Atlantic Shores project and related New Jersey wind turbine sites I would ask BOEM to reexamine their prior Environmental Impact Statements as to all such actions previously enacted. Any and all	Refer to response to comment BOEM-2024-0001-0354-0003. BOEM’s project-specific NEPA document for each COP includes a cumulative impacts analysis that considers the impact of project alternatives in combination with other planned non-offshore-

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	actions including but not limited to those taken by BOEM as to the Atlantic Shores Project must be thoroughly reviewed in conjunction with the within nearby six (6) leases in the "NY Bight" DEIS as to cumulative and indirect impacts upon the entire Atlantic Ocean eco system. The lack of such a review process as to cumulative and indirect impacts with respect to the already awarded lease sites calls into question the entire process and each and every such lease and construction activity already authorized by BOEM including but not limited to any and all approvals associated with the Atlantic Shores Project which is in close proximity.	wind activities and planned offshore wind activities. In the Atlantic Shores EIS, the planned offshore wind projects in the NY Bight were included in the cumulative impacts analysis.
BOEM-2024-0001-0357-0030	There are also programmatic reasons for including the New Jersey wind energy area in the PEIS. First the CEQ NEPA rule 1501.9(e)(1)iii calls for actions that are interdependent parts of a larger action to be dealt with in the same impact statement. Likewise CEQ NEPA rule 1502.4(a) requires that agencies "shall evaluate in a single environmental impact statement proposals or parts of proposals that are related to each other closely enough to be in effect a single course of action". With regard then to the scope of this EIS the New York Bight areas provide opportunities to serve the two well-defined State programs that enable the development through power purchases the New Jersey State program for 7500 megawatts of power by 2035 and the New York State program for 9000 megawatts as mentioned in the Notice of Intent. In fact development in one lease area may supply energy to both programs. Therefore the Program EIS should address those two programs and for each New Jersey lease area (A-0498 A-0532 A-0499 and A-0549) and each current New York Bight potential lease area (A-0537 A-0538 A-0539 A-0541 A-0542 A-0544 and A-0512) estimate and show the amount of power destined to go to each State. Regarding the New Jersey program due to the relative proximity of the Hudson South area to New Jersey versus New York and its beneficial environmental factors versus the extremely close to shore New Jersey area development in the Hudson South area should contribute substantially to the New Jersey program and therefore must be considered with the current New Jersey lease areas together in this Program EIS document.	Refer to response to comment BOEM-2024-0001-0354-0003. The purpose of the PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. The PEIS does disclose the cumulative effects of buildout of other ongoing and planned offshore wind projects on the OCS within the geographic area of analysis for each resource. Each of the six NY Bight lease areas is required to undergo project-specific environmental analyses through the development and submittal of an SAP and the COP. The purpose and need further states that the PEIS supports federal and state goals, but it is not intended to meet state obligations. The developer for each lease is responsible for obtaining offshore renewable energy credits (ORECs) and determining where power from each lease area will go. BOEM’s leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals.

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BOEM-2024-0001-0423-0032	Appendix C: Tiering Guidance The tiering guidance is not very useful and very high level BOEM should provide additional detail here on specifically how it will tier the project-specific EIS from the PEIS and how this will save time. The Draft PEIS permits lease areas to "tier or incorporate by reference [the] PEIS" in order to "provide for greater efficiency and reduce duplication of analyses in complying with NEPA requirements." It is hard to imagine how a PEIS at this stage in the project development process especially one as flawed as the one before us could offer an opportunity for meaningful "tiering" by lessees. It is certainly possible that some of the material in the PEIS could indeed be "incorporated by reference" in the NEPA documents for NY Bight lease area project(s) particularly the affected environment sections however Appendix C indicates that essentially all of the impact analysis must be done at the project-specific review stage using the information that leaseholders will provide in their COPs. The need to conduct the impact analysis during the project-specific review to assess the applicability of AMMMs proposed in the PEIS to the specific project and to compare and analyze project-specific COPs to the RPDE in the PEIS adds new and additional complexities and is certainly very unlikely to save time.	Appendix C is intended to provide high-level information regarding the type of information BOEM anticipates could be incorporated by reference and the additional analysis that is expected at the COP-level NEPA review. However, each COP will need to be evaluated once it is received to determine what type of activities are proposed and to what extent the PEIS can be incorporated by reference.
BOEM-2024-0001-0436-0003	A well-crafted programmatic NEPA review provides the basis for future decisions such as identifying broad mitigation and conservation measures that can be applied to subsequent tiered reviews. This is a practice undertaken in other PEISs by the Department of the Interior. [Footnote 3: E.g. the Draft Utility-Scale Solar Energy Development Programmatic Environmental Impact Statement (Draft Solar Programmatic EIS) has been proposed to update the Bureau of Land Management (BLM) 2012 Western Solar Plan to support current and future national clean energy goals long-term energy security climate resilience and improved conservation outcomes 2023/2024 Solar Programmatic EIS Information Center (anl.gov) https://blmsolar.anl.gov/solar-peis-2023/.] These documents provide guidelines and considerations for future actions based on best practice and lessons learned from past precedent. The New York Bight PEIS should similarly be reframed with this high-level process orientation. Rather than adding to site-specific analytical	BOEM recognizes the value of programmatic NEPA reviews for purposes of supporting tiered, project-level reviews and for identifying mitigation measures. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in the PEIS and identifies the additional analysis that BOEM anticipates may be required in the COP-specific NEPA analysis for each lease area to support the development of AMMM measures specific to each proposed project. However, each COP will need to be evaluated once it is received to determine what type of activities are proposed and to what extent the PEIS can be incorporated by reference. Based on comments received on the Draft PEIS, BOEM has revised Alternative C to group AMMM measures into sub-alternatives (see Final PEIS Chapter 2): Sub-alternative C1 and Sub-alternative C2. Sub-alternative C1 analyzes the AMMM measures that BOEM has required as conditions of approval for

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	requirements the PEIS should provide guidelines and analysis to support decision making for individual projects and outline a process for project-specific deviations that may result from factors such as improved technology innovation and project-specific circumstances. BOEM should make revisions throughout the PEIS to support this appropriate framing of a programmatic NEPA review.	previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations. Sub-alternative C2 analyzes the AMMM measures under Sub-alternative C1 plus AMMM measures that have not previously been applied. These AMMM measures that have not been previously applied may be less familiar to the offshore wind industry but could further avoid and minimize impacts on resources if applied. BOEM may require some or all of these measures as conditions of approval for activities proposed by lessees in COPs submitted for the six NY Bight lease areas. BOEM will conduct project-specific NEPA analysis of the COP for each lease area. This analysis will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies during the COP-level NEPA review.
BOEM-2024-0001-0436-0018	Use of PEIS to Streamline COP-specific NEPA Reviews The Council on Environmental Quality NEPA regulations make clear that programmatic environmental reviews like this PEIS are not simply an analytical document but the first step in a tiering relationship that is completed by incorporation into site-specific analysis. 40 CFR 1501.11. BOEM should better explain and interpret its OCSLA authorities as applied to the relationship between this PEIS and the environmental review of six New York Bight COPs. According to the Notice of Intent for the New York Bight PEIS the primary mission of the PEIS is to make COP-specific NEPA reviews easier by avoiding redundant analysis. Importantly AMMMs should not be proposed for adoption where the PEIS analysis indicates that an impact is not "ripe" due to lack of project-level information.	The PEIS appropriately identifies AMMM measures that may be applicable to more than one NY Bight lease area, are reasonable and enforceable, and allow for flexibility where appropriate. BOEM will conduct project-specific NEPA analysis of the COP for each lease area as part of BOEM's authority under the OCSLA. Project-specific alternatives will be considered by BOEM and cooperating agencies during the COP-level NEPA review. Refer to response to comment BOEM-2024-0001-0436-0003 regarding changes to the AMMM measures and Alternative C as a result of comments received on the Draft PEIS.
BOEM-2024-0001-0436-0019	Appendix C Tiering Guidance in the Draft PEIS can be a useful tool particularly with regards to tiering to the PEIS affected environment and impact analysis. Appendix C provides helpful guidance on what information from the PEIS could be incorporated by reference into the future COP-specific NEPA analyses and identifies additional analysis that BOEM anticipates would need to be performed as part of the COP-specific NEPA analysis once detailed and site-specific project information is available. Equally important however will be	Comment noted.

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	BOEM's commitment to these guidelines so that the ruleset for tiering to the PEIS is not a moving target for developers.	
BOEM-2024-0001-0439-0012	The PEIS should be an analytical tool for the purposes of tiering subsequent environmental reviews. A PEIS should evaluate the effects of planning level decisions including in this case the effects of implementing certain AMMMs. A PEIS is an important NEPA tool for improving efficiencies and reducing agency burden by allowing for site-specific reviews to tier from the PEIS. Indeed CEQ's recently proposed NEPA regulations[Footnote 20: While not finalized NEPA Phase II regulations will likely be finalized prior to the finalization of the PEIS. Moreover the NPRM notes that "An agency may apply the regulations in this subchapter to ongoing activities and environmental documents begun before" the effective date of the final rule. See 88 Fed. Reg. 49924 (July 31 2023).] recognize the value of a PEIS for the purposes of tiering.[Footnote 21: 88 Fed. Reg 4992 (July 21 2023) (noting programmatic reviews are re important tools to facilitate more efficient environmental reviews and project approval).] The proposed regulations note that "agencies generally [italicized: should] tier their environmental impact statements and environmental assessments when it would eliminate repetitive discussions of the same issues focus on the actual issues ripe for decision and exclude from consideration issues already decided."[Footnote 22: Proposed 40 CFR 1501.11.] Drafted correctly the NY Bight PEIS could play the role described above and help reduce the time it takes to finalize COP review. Unfortunately the current version does not achieve this objective. Instead it appears to rely on the PEIS process to adopt wholesale all AMMMs that are identified through the PEIS process. In doing so BOEM is not only making decisions which are not appropriate this early in the process but it is also placing the burden on the lessee to show that certain AMMMs are not warranted.	Refer to response to comment BOEM-2024-0001-0436-0003. The COP-specific NEPA ROD for each lease area will describe the specific terms and conditions for which compliance is required (40 CFR 1505.3), including any applicable AMMM measures analyzed in the PEIS.
BOEM-2024-0001-0439-0013	Indeed BOEM admits that it lacks sufficient project- and site-specific information at this PEIS stage to determine which AMMMs may be appropriate stating that it "may require additional or different measures based on future site-specific NEPA analysis or the parameters of specific COPs."[Footnote 23; Draft PEIS at ES-3.] In fact as identified in Appendix C almost all impact assessments are	Refer to response to comment BOEM-2024-0001-0436-0003.

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	deferred to the individual project NEPA process. BOEM's proposal to adopt all AMMMs identified in this process at the PEIS stage [italicized: and then evaluate them again] at the site-specific stage to determine which AMMMs are appropriate (including AMMMs that were not adopted in the PEIS)[Footnote 24: See e.g. id. at ES-1 ("The project-specific analyses could incorporate additional or different AMMM measures as needed").] exposes that the adoption of AMMMs is not ripe at this PEIS stage. The premature adoption of these AMMMs undermines tiering's efficiency goals and will lead to duplication of effort and an [italicized: increase] in the data and analysis that will be necessary to prove that certain adopted AMMMs are inapplicable at the site-specific level. This is the very duplication of effort that NEPA's implementing regulations attempt to avoid. The Offshore industry provides detailed comments on the AMMMs and these issues in Attachment A. The PEIS should be an analysis of appropriate programmatic AMMMs that BOEM [italicized: may] consider as a condition of approval. BOEM should be able to rely on the analysis of the AMMMs to tier subsequent site-specific reviews. Finally to ensure the promises of efficiency under a PEIS the AMMMs considered at this stage should not only be reasonable and economically and technically feasible but they should also be [italicized: ripe] for review.	
BOEM-2024-0001-0450-0008	Tiering for Project-Specific NEPA Analyses In general the Draft PEIS proposes a transparent and smart approach and opportunity to reduce impacts region-wide while achieving efficiency gains. One of the major advantages of conducting a PEIS is to provide a roadmap for responsible development where the review at the project stage can be limited to site-specific matters not covered in the PEIS if the project proponent generally adheres to the measures examined in the PEIS. As the PEIS states: The analysis in this PEIS was developed for integration with site-specific NEPA reviews. Project- specific analyses that tier from or incorporate by reference this PEIS will evaluate whether a project would have greater equal fewer or different impacts than those that were analyzed in the PEIS by considering the level of action analyzed and the particularities of the site. Future COP-specific NEPA documents will focus on providing site- and project-specific analyses that were	While the PEIS provides a framework for environmental review by analyzing AMMM measures, each of the six NY Bight lease areas is required to undergo project-specific environmental analyses through the development and submittal of an SAP and the COP. If a lessee makes changes to the PDE after the initial submittal of the COP, a COP revision is required. Any PDE changes will be analyzed during the COP-level NEPA review prior to final approval. BOEM will complete a NEPA review for each COP; this review will include a detailed evaluation of potential impacts for the development of each lease area in the NY Bight, including a cumulative impacts analysis. For each resource area (including air quality, birds, bats, and marine mammals), Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis,

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	not already addressed by the PEIS. [Footnote 14: Draft PEIS at ES-4.] We strongly support the ability of project-level NEPA analyses to tier to the PEIS. Tiering guidance is provided in Appendix C on the type of matters that will be examined in site specific reviews. It is critical that both site-specific impacts as well as deviations from the scope of the representative project design envelope (RPDE) be examined in separate environmental analyses on a project specific level and at the COP approval phase. If there are "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts" [Footnote 15: 40 CFR 1502.9(d)(1)(ii).] then it is both critical and required that those be examined in a new analysis. As noted above these project-specific analyses should take the form of environmental impact statements and not environmental assessments particularly given the relatively early stage of the U.S. offshore wind industry's development. This is bolstered by the fact that many of the factors as laid out in the Draft PEIS Appendix C that would be covered in a subsequent analysis could be significant. These factors include "characterizations of air quality around onshore facilities" which is a major concern to local communities; onshore and transmission related impacts to habitat for bats and birds and other species; the occurrence of marine mammals including the severely endangered North Atlantic right whale within the lease area; and the specific impacts of noise presence of structures and traffic from the project. [Footnote 16: See Draft PEIS at App. C.]We also reiterate that a PEIS even earlier at the siting stage would help in ensuring selection of the most suitable sites for development. Siting itself can result in the substantial reduction or avoidance of impacts to species and other resources obviating the need for more expensive and sometimes less effective mitigation measures at the project level.	and AMMM measures discussed in this PEIS and identifies additional analysis that may be included in the COP-specific NEPA analysis for each lease area. Prior to the lease auction, BOEM completed extensive agency consultation and public engagement to determine the areas included in the Final Sale Notice to minimize potential environmental impacts and to avoid use conflicts (see Section 1, Table 1.1 for a summary of BOEM's planning and leasing activities for the NY Bight).
BOEM-2024-0001-0452-0002	Approaches to PEIS Alternatives Tiering and Analysis PEIS analysis should have been conducted prior to any lease auction because siting is the most effective tool to maximize avoidance minimization mitigation and monitoring efforts. This would increase flexibility and provide sufficient time to identify and implement the most effective mitigation measures. All future NEPA analysis of project-specific alternatives must continue to require an EIS not an	Prior to the lease auction, BOEM completed extensive agency and public engagement to determine the areas included in the Final Sale Notice (see Section 1, Table 1.1 for a summary of BOEM's planning and leasing activities for the NY Bight). Each of the six NY Bight lease areas is required to undergo project-specific environmental analyses through the development and submittal of an SAP and the COP. Following the

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	EA because the current approach leaves the moderate to major impacts identified in the PEIS (and their associated mitigation alternatives) to only be analyzed once a COP has been submitted. The structure of the alternatives will be critical to the success of this approach. RODA has previously commented on the structure of the No Action alternative used by BOEM in Environmental Impact Statement analysis such as in our South Coast Wind DEIS comments. [Footnote 11: See https://rodafisheries.org/wp-content/uploads/2023/04/230418_Southcoast-DEIS.pdf.] We again highlight our concern over any conflation of the No Action alternative with a cumulative effects analysis.	completion of this PEIS, BOEM will complete a NEPA review for each COP; this review will include detailed evaluation of potential impacts for the development of each lease area in the NY Bight, including a cumulative impacts analysis. The level of NEPA review and content of the review will be determined by BOEM upon receipt and review of each COP.
BOEM-2024-0001-0547-0005	Appendix C of the PEIS provides for how the Project will be used; however the qualified impact does not act the way the Project was designed. [Footnote 6: PEIS Appendix C: Tiering Guidance provides for evaluation of impacts that could result from wind energy development in the NY Bight lease areas as well as the AMMM reasons for a nebulous Construction and Operations (COP) Plan analysis perhaps in the future.] The PEIS is faster for the federal government but at the same time its vagueness is giving the wind industry a free pass at the expense of the local environment New Jersey's local economies the health and welfare of its human marine avian and other coastal inhabitants and ocean floor - all of which will be exposed to and have their ecosystems severely disrupted because of BOEM's inefficiencies in the PEIS process. Further the Atlantic City area disproportionally will bear the effects of the six NY Bight lease areas' cumulative effects on an already overburdened population. [Footnote 7: See PEIS at Table D1-9 3.6.4 at C-11 and C-12; see also N.J.S.A. 13:1D-157 et seq.; https://dep.nj.gov/ej/law/.; Atlantic Shores Federal Consistency Certification Request published by New Jersey Department of Environmental Protection September 19, 2023 (overburdened communities include Brigantine NJ in Atlantic County NJ).]	The purpose of the PEIS includes identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. The PEIS is an extra step in BOEM's leasing and permitting process and does not circumvent or override any requirements of COP review and approval. While the PEIS provides a framework for environmental review, each of the six NY Bight lease areas is required to undergo project-specific environmental analyses through the development and submittal of a COP. BOEM's NEPA analysis of the COP for each lease area will include detailed evaluation of impacts and assessment of AMMM measures based on site-specific data.

P.5.26 National Environmental Policy Act/Public Involvement Process

Table P.5-26. Responses to Comments on National Environmental Policy Act/Public Involvement Process

Comment No.	Comment	Response
BOEM-2024-0001-0002-0001	The federal Bureau of Ocean Energy Management (BOEM) released a 1429-page Programmatic Environmental Impact Statement (PEIS) that presents impacts of offshore wind turbines in six large leases in the New York / New Jersey Bight. The public only has 45 days from 1/8/24 to 2/26/24 to review this monstrous document for offshore & onshore impacts. These lease areas totaling more than 488000 acres of the ocean were purchased at auction by private companies for more than 4.3 billion dollars in 2022. There needs to be more time for review	Publication of the Draft PEIS initiated a 45-day comment period, which was extended in response to requests from Tribal nations and stakeholders. The comment period ended on March 13, 2024. During the comment period, BOEM held five public meetings. In-person meetings were held in Massachusetts on February 5, 2024; in New York on February 7, 2024; and in New Jersey on February 8, 2024. Two virtual meetings were held on January 31, 2024 and February 13, 2024. As described in the NEPA regulations, an agency should commence preparation of an EIS as close as practicable to the time the agency received a proposal so that the Final EIS can contribute to the decision-making process (40 CFR 1502.5). After the conclusion of the comment period, BOEM assessed and considered all the comments received in preparation of the Final PEIS. BOEM is compliant with CEQ's requirement for a Draft EIS to be published for public review and comment for a minimum of 45 days.
BOEM-2024-0001-0003-0001	The public needs more time to review this monstrous document for these lease areas totaling more than 488000 acres of the ocean at the cost of 4.3 billion dollars. The current scope magnitude and speed of the industrialization for wind energy are unprecedented and will result in vast marine ecosystem destruction. Studies to determine impacts are underway but are too little too late and cumulative impacts are largely ignored.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0004-0001	Request a 90-DAY EXTENSION TO THE PUBLIC COMMENT PERIOD on BOEM'S Draft Programmatic Environmental Impact Statement for SIX Offshore Wind Lease Areas off NY/NJ Too much is at stake to rush through the industrialization of the Eastern Seaboard.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0005-0001	Please allow for a 90 day extension for public comment!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0007-0001	In the name of good governance due process fairness public interest and the democratic process Clean Ocean Action ("COA") respectfully and urgently requests that you extend the deadline for public comments on the New York Bight Draft Programmatic Environmental Impact Statement ("Draft PEIS") by a minimum of ninety (90) additional days. The Draft PEIS encompasses a broader area than has ever been analyzed in a single National Environmental Policy Act ("NEPA") review document for the offshore wind industry. It is over 1000 pages including appendices with important information. Therefore it is unrealistic to expect the public to be able to meaningfully review analyze and comment on such a complex and comprehensive document within the minimum 45-day period so the comment period must be extended.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0007-0002	COA is a regional broad-based coalition of conservation environmental fishing boating diving student surfing women's business civic and community groups with a mission to improve and protect the marine waters in the New York Bight. COA has been actively engaging with the Bureau of Ocean Energy Management ("BOEM") and other state and federal agencies about the development of offshore wind energy for more than a decade to ensure the protection of the marine environment and resources including submitting public comments on the offshore wind projects currently in development in the New York Bight. COA will continue to monitor and comment on any future projects proposed in the region so we have a strong vested interest in the Draft PEIS. The public has a heightened interest in offshore wind development as well especially in coastal localities in the New York Bight because they depend on the ocean's health to support commercial and recreational fishing as well as the tourism industry. The development of offshore wind projects in the region has been rapid especially relative to the state of the scientific study on the environmental effects of such widespread industrialization in the area. If approved the PEIS would speed up offshore wind development even further at the expense of site-specific study. Providing only the minimum public comment period is yet another example of BOEM unreasonably hastening the offshore wind development process.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. This PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lease holder is required to conduct project-specific environmental analyses through the development and submittal of a COP, as required under 30 CFR 585.628. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area.

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BOEM-2024-0001-0007-0003	NEPA's implementing regulations provide that when an agency publishes a DEIS the public must be provided a minimum of forty-five (45) days to review and comment on the document [Footnote 1: 40 C.F.R. 1506.11(d).]. However BOEM is not limited to this time period which is wildly unrealistic and unjust in this instance given the unprecedented scope and highly technical nature of this document. BOEM has never before considered the region-wide effects of any and all future offshore wind projects in a single environmental impact statement. As such it is critically important for commenters to analyze whether each detail in the Draft PEIS can reasonably be applied to all individual offshore wind projects in the area. The public cannot reasonably complete this task within forty-five (45) days. NEPA is meant to provide the public with opportunities to meaningfully contribute to decisions that significantly affect the environment. To be meaningfully involved in this decision the public needs sufficient time to review and critically analyze the scientific and technical language within the Draft PEIS. COA will submit substantive comments on the Draft PEIS but our comments will be more helpful to BOEM if we can more comprehensively review the document and conduct any necessary research. In closing extending the public comment period by at least ninety (90) additional days to May 26 2024 serves the interest of good governance due process and transparency. Please contact us if you have any questions.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0010-0001	I Demand more time for review! We meed more time to properly review and understand this document.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0011-0001	I request an extension to the official review period for the 1428 page PEIS concerning the ecological impacts of Off Shore Wind Industrialization for the six large lease areas abutting the NJ and NY coast.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0012-0001	Please extend comment period to protect 488000 acres of our ocean! You have six offshore wind projects- six! What is the reason for your haste to limit comments that will provide valuable consideration for your decisions today that will negatively impact our future?	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0013-0001	I am requesting a 90-DAY EXTENSION TO THE PUBLIC COMMENT PERIOD on BOEM'S Draft Programmatic Environmental Impact Statement for SIX Offshore Wind Lease Areas off NY/NJ - The federal Bureau of Ocean Energy Management (BOEM) released a 1429-page Programmatic Environmental Impact Statement (PEIS) that presents impacts of offshore wind turbines in six large leases in the New York / New Jersey Bight. This only allows the public only 45 days from 1/12/24 to 2/26/24to review this monstrous document for offshore & onshore impacts. These lease areas totaling more than 488000 acres of the ocean were purchased at auction by private companies for over 4.3 billion dollars in 2022. The public needs more time for review!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0016-0001	Why is there such a rush? If the leases were sold in 2022 to give a reasonable amount of time to review over 1400 pages should not be an issue. More time to review!!!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0017-0001	As residents of Monmoith County New Jersey who will be impacted by any effect the wind projects might have we are requesting an extension to the 90 day review period. Ninety days is not sufficient for a review of the document just released by your agency.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0018-0001	It is important to allow for an appropriate review time for a document outlining such policies and projects that may greatly impact a resource as precious as the ocean like these wind turbines. Extend the review period beyond 90 days so that a clear and helpful decision can be made by experts. Don't forgo prudent planning for corporate interest.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0019-0001	We need more time to evaluate! With the recent closure of other wind projects more time is needed to avoid another TAX PAYER disaster!!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0020-0001	Please extend the review period for the environmental impact study for impacts of proposed wind farms off the coast of NJ. This is new technology and impacts are NOT fully known. We are running the very real risk of irreversible damage to the environment by building wind farms: doesn't it make sense to slow down and make sure we know what we are doing before we do it???Please for the sake of our children grandchildren and all future generations extend the deadline and let there be proper review!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0021-0001	Please extend the period to review the Environmental Impact Statement for the six offshore wind projects planned off the coast of NJ by at least 90 days to allow adequate time to review this huge document.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0023-0001	It is important that we extend the comment period from 45 days to 90 days to give all of us enough time to review the PEIS and have a clear understanding of the impacts.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0024-0001	I am writing to express my concern and request an extension of the public review period for the recently released Programmatic Environmental Impact Statement (PEIS) on offshore wind turbines in the New York / New Jersey Bight. The current 45-day period spanning from 1/12/24 to 2/26/24 is insufficient for a comprehensive review of the substantial 1429-page document. Given the complexity and extensive nature of the PEIS it is imperative that the public be granted an extended timeframe of at least 90 days to thoroughly assess its contents. The information presented in this document has far-reaching implications for the environment particularly concerning the impacts on the ocean and marine life. The significance of the current government's plans for offshore wind necessitates a thorough and thoughtful review by the concerned public. A 90-day review period would allow for a more inclusive and informed engagement from various stakeholders ensuring that diverse perspectives and expertise are considered in the decision-making process. I urge the Department of the Bureau of Ocean Energy Management to prioritize transparency public participation and the thorough examination of potential environmental impacts. Extending the review period will contribute to a more robust and informed public commentary ultimately leading to better-informed decisions regarding the proposed offshore wind projects.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0025-0001	The federal Bureau of Ocean Energy Management (BOEM) released a 1429-page Programmatic Environmental Impact Statement (PEIS) that presents impacts of offshore wind turbines in six large leases in the New York / New Jersey Bight. Since the public was only given 45 days from 1/12/24 to 2/26/24to review this monstrous document for offshore & onshore impacts I am requesting & demanding more time for review!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0026-0001	We would like a 90 day extension to the public comment for the wind energy development in ny and nj	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0027-0001	The public needs more time to review the report!!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0028-0001	As a citizen of New Jersey and a advocate for ecology I demand more time for public opinion and retort to Offshore Wind and it's unbelievably abhorrent push to apply unnatural man made structures to our beautiful oceans. This experiment to see if Wind Turbines actually reduce global warming is slowly failing in other parts of the world; thus producing the pilot of things to come. The cooling stations (substations) alone pull in incredible amounts of water only to heat an add chemicals only to be released back into the environment at an alarming rate. The water seems to be heated to a 96 +\- degree temperature that may be unnaturally warm our ocean faster than the "Global Warming" calculations. More research must be conducted on the interruption of migratory marine animals as well as avian species. 45 days is not enough time for public out reach on these matters I think 90 days is still too short to rush these unprecedented mammoth Eco-killing machines. Please; for the love of good find a better way to produce energy that doesn't leave such a big profile on our planet. Millions of acres of sea land will be decimated for the greed of mankind. The OCEAN's ONLY enemy is MANKIND.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. Each lease holder is required to conduct project-specific environmental analyses through the development and submittal of a COP as required under 30 CFR 585.628. For each resource area, Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area.
BOEM-2024-0001-0029-0001	I would like you to issue an additional 90 days to the review period for the Programmatic Environmental Impact Statement (PEIS) that presents impacts of offshore wind turbines in six large leases in the New York / New Jersey Bight. The current review period from 1/12/24 to 2/26/24 is not enough time to review this 1400 page document. Please add a 90 day extension to begin on 2/27/24 so that stakeholders and the public can properly review this document.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0030-0001	while I am in favor of reducing our use of fossil fuels I think we must be prudent in our installation of off shore wind turbines and extend the review period to at least 90 days so that the public can carefully	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	review the ramifications of the installation especially the environmental impact.	
BOEM-2024-0001-0031-0001	considering the high stakes finances and lifespan of this project I encourage you to extend the review time of the draft Environmental Impact Statement of Wind Energy Development in the New York Bite by an additional 90 days.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0032-0001	To demand a 90 day extension to the public comment to review the lengthy document regarding NJ offshore wind leases!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0033-0001	I demand a 90 day extension. 45 days is not nearly enough time for the public to read and understand a 1400+ page document. We deserve a say and before we can adequately speak we need to understand.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0036-0001	I request that the "comment period" be extended by 90 days.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0037-0001	AT LEAST A 90 DAY EXTENSION OF PUBLIC COMMENT PERIOD OR A LONGER EXTENSION IS ABSOLUTELY NECESSARY. Currently the public has only been provided a short 45 day period in order to review a vast 1429 page document the subject matter of which would effect the Atlantic Ocean and the entire ocean ecosystem in perpetuity. Our town any professionals with whom we may desire to consult and the public in general have been provided a woefully insufficient span of a mere 45 days to attempt even a cursory process of this voluminous document and its many attachments. The proposal will directly impact over 500000 acres of the Atlantic Ocean. Indirect impacts have lasting ramifications as to the entire ocean environment. Just a preliminary review of the gigantic draft PEIS suggests that monitoring and assessments of a pilot scale project be implemented prior to moving ahead with such an irreversible and potentially damaging proposal. Truly independent evaluation with peer reviewed science is warranted.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. In the PEIS, BOEM considered but dismissed (Chapter 2, Table 2-3) from further consideration an alternative to build a pilot project. BOEM does not have the authority to prevent developers from submitting COPs and developing commercial-scale projects until after a pilot project is proposed and built. Data from sites that are constructed and operating (e.g., Block Island), as well as the pilot project in Virginia, were incorporated into this PEIS and will be incorporated into the development of project-specific COPs and EISs.
BOEM-2024-0001-0039-0001	The future of our oceans is too important therefore we should not be forced to rush into decisions. The public environmental scientists & our representatives need time to properly review documents &	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	research. THE 45 DAY DEADLINE TO REVIEW THE PEIS MUST BE EXTENDED.	
BOEM-2024-0001-0040-0001	The Bureau of Ocean Management is giving only 45 days to review and comment on the development of wind turbines off the NJ coast. This development could have devasting far-reaching and long lasting effects on our oceans. The Bureau has provided a 1429 page document for the general public to read digest and comment on in only 45 days. Shame on you! This is a horrendous breach of the compact between government and its citizens.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0040-0002	This whole process needs to be opened up to public hearings in the affected locations. Only then will our government which is expected to provide what the citizenry wants and needs will hear and see what the people of NJ really want and need. And we don't need these wind turbines shoved down our throats with a 45-day comment period. I demand that open in-person public hearings be held all along the shore communities in New Jersey (not just one place for one night which only includes an "informal open house concept") so that the Bureau and politicians can hear the reactions of the ordinary citizens on this potentially devastating environmental travesty about to happen.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0041-0001	I am a NJ coastal property owner and have grave doubts about the adequacy of Federal and NJ State environmental assessments regarding the proposed wind turbine projects in our coastal waters. There is no reason huge development projects like this in our ocean should be fast tracked risking permanent environmental damage. Please extend the comment deadline for 90 days to allow time for adequate and objective environmental assessment to be completed.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0045-0001	Please extend the comment period by 90 days so that the public has time to review. This issue is too sensitive to rush through without giving the public due time.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0046-0001	The process for this Draft PEIS and cumulative impact statement is appropriate and legal as it was prepared following the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 et seq.) and implementing regulations (40 CFR parts 15001508). The Council on Environmental Quality's (CEQ's) regulations at the time the Notice of Intent (NOI) for this PEIS was	Thank you for your comment.

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	issued contained a presumptive time limit of 2 years for completing environmental impact statements (EISs) and a presumptive page limit of 150 pages or fewer or 300 pages for proposals of unusual scope or complexity. BOEM has prepared this Draft PEIS in accordance with the CEQ NEPA implementing regulations effective May 20 2022. Additionally this Draft PEIS was prepared consistent with the U.S. Department of the Interior's NEPA regulations (43 CFR part 46) longstanding federal judicial and regulatory interpretations and Administration priorities and policies including Secretary's Order No. 3399 requiring bureaus and offices to not apply any of the provisions of the 2020 changes to CEQ regulations (85 Federal Register 43304-43376) "in a manner that would change the application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect."	
BOEM-2024-0001-0072-0001	As requested please allow for a 90 day extension for public comment!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0101-0001	I request an extension to the official review period for the 1428 page PEIS concerning the ecological impacts of Off Shore Wind Industrialization for the six large lease areas abutting the NJ and NY coast.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0105-0001	Extend public comment for 90 days.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0167-0001	Please give the 90 days! We can't let this happen to our waters our fishing industries ! Please	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0169-0001	I echo other calls demanding an extension to this public comment period currently set to end on 2/26/24 after only 45 days. This PEIS is nearly 1500 pages long encompasses six large lease areas in the NY and NJ Bight which total over 488000 acres and were purchased for $4.3 billion (2022). More time is needed to allow the public to review such a gargantuan document that will impact an incredible swath of the Atlantic.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0175-0001	I write to oppose the six wind energy projects off New York/New Jersey. After attending two virtual public meetings on BOEM's programmatic Environmental Impact Statement I strongly request that more transparency and studies be made to the public [Underline: before] any further approvals or construction begins. When concerns were brought up some of the responses that stood out most were "there are data gaps". That seems like a lot of data gaps for you to have when we are looking at six offshore wind lease areas in the NY Bight which in this case totals over 488000 acres of the ocean. May I remind BOEM that your mission is to manage development of U.S. Outer Continental Shelf energy in an [Underline: environmentally and economically responsible] way.	This PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lease holder is required to conduct project-specific environmental analyses, which include development and submittal of a COP, as required under 30 CFR 585.628. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of each resource area.
BOEM-2024-0001-0176-0001	Firstly I would like to request a 90 extension to the comment period due to the shear size of the PEIS.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0180-0001	I am extremely dismayed at BOEMs exercise of irresponsibility by not allowing ample review time for this 1429 PEIS regarding the impact of offshore wind turbines in the New York Bight. It is an example once again of BOEM turning a blind eye to the fact that offshore wind activity is putting coastal ecosystems at risk of collapse.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0224-0006	I urge for a more comprehensive and transparent evaluation of the environmental impact before making a final decision. Additionally I request an extension of the comment period to allow for thorough public scrutiny and informed contributions.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0225-0001	I urge you to extend the public comment period on the proposed wind farm project AT LEAST another 45 days. This project is moving forward without the public knowing the costs or more importantly the environmental and economic impact of this plan. Many knowledgeable people believe that wind energy is unduly expensive inefficient and does little to reduce climate change. You cannot just proceed without public input.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0242-0001	Need a 90 day extension to review all documentation.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0262-0002	The scope of current off-shore wind proposals and projects is absurd. BOEM has given the public just 45 days to review a 1429 page draft "Programmatic Environmental Impact Statement (PEIS) for Expected Offshore Wind in the New York Bight." I as a tax-paying citizen of New Jersey more specifically of the Jersey Shore demand at least a 90-day extension to the public comment period to review the draft PEIS; 45 DAYS IS NOT ENOUGH to review this monstrous document for offshore & onshore impacts. This push to have offshore wind projects authorized without the public's input is completely reckless and unacceptable.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0282-0001	I want a 90 day extension to study further.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0290-0001	We need at least a 90 day extension! We have not had enough time to comment. Why can't you wait for the Government Accountability study to br completed? We have to make sure that this technology will not hurt our ocean and marine life. Too much too fast!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0304-0001	The federal Bureau of Ocean Energy Management (BOEM) released a 1429-page Programmatic Environmental Impact Statement (PEIS) that presents impacts of offshore wind turbines in six large leases in the New York / New Jersey Bight. Since the public was only given 45 days from 1/12/24 to 2/26/24to review this monstrous document for offshore & onshore impacts I am requesting & demanding more time for review!	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0309-0001	As a Brigantine New Jersey homeowner and stakeholder I am writing to respectfully request a 180-day extension seeking more time to submit comments to the New York Bight Draft Programmatic Environmental Impact Statement ("PEIS") for the proposed project comprising six NY Bight lease areas ("the Project") offshore New Jersey and New York.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0309-0002	In addition I am writing to record my complete disapproval of the Project including lack of adequate notice in the PEIS process resulting in loss of due process for the stakeholders and affected environmental justice communities lack of adequate mitigation analysis (aka "AMMM Measures") failure to analyze "focused regional cumulative effects" [Footnote 1: BOEM PEIS Docket No.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. The analysis of the overall impacts of a full buildout of six projects in the NY Bight lease areas as part of Alternative B and Alternative C evaluated comprehensive cumulative impacts by examining offshore wind activities within the NY Bight area as a

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	BOEM-2024-0001 ("PEIS") at ES-4.] and other violations of NEPA and respectfully request a decision of No Action.	whole. Cumulative impacts for each resource were analyzed and are discussed in Section 3.
BOEM-2024-0001-0309-0002	In addition I am writing to record my complete disapproval of the Project including lack of adequate notice in the PEIS process resulting in loss of due process for the stakeholders and affected environmental justice communities lack of adequate mitigation analysis (aka "AMMM Measures") failure to analyze "focused regional cumulative effects" [Footnote 1: BOEM PEIS Docket No. BOEM-2024-0001 ("PEIS") at ES-4.] and other violations of NEPA and respectfully request a decision of No Action.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. The analysis of the overall impacts of a full buildout of six projects in the NY Bight lease areas as part of Alternative B and Alternative C evaluated comprehensive cumulative impacts by examining offshore wind activities within the NY Bight area as a whole. Cumulative impacts for each resource were analyzed and are discussed in Section 3.
BOEM-2024-0001-0309-0003	There is ample precedent for the Bureau of Ocean Energy Management ("BOEM") to extend the comment period for offshore wind projects such as this Project affecting offshore New Jersey and New York based on requests from the public for less complex projects than this NY Bight's six wind farm leases where time to comment was extended. For example BOEM has recently granted comment period extensions for the Sunrise and South Coast Wind projects among others [Footnote 2: Based on requests from the public on April 3 2023 BOEM announced a 15-day comment period extension for the DEIS for the proposed South Coast Wind (formerly Mayflower Wind) project offshore Massachusetts. https://www.boem.gov/newsroom/notes-stakeholders/comment-period-extended-southcoast-wind-draft-environmental-impact. On May 4 2022 BOEM announced the extension of the comment period by 10 days in response to stakeholder request regarding the Proposed Sale Pacific Wind Lease Sale 1. https://www.regulations.gov/document/BOEM-2022-0017-0001. BOEM extended the comment period to October 4 2021 for the Sunrise Wind project offshore New York. https://www.boem.gov/renewable-energy/state-activities/sunrise-wind#:~:text=On%20August%2031%2C%202021%2C%20BOEMand%20to%20make%20technical%20corrections. BOEM extended the comment period for the Call and the NOI for North Carolina's Offshore Wind Energy project originally published in the Federal Register on December 13 2012 for a 45-day comment period that ended on January 28 2013. Notices at the request of stakeholders seeking more time to submit comments were subsequently	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	extended to March 7 2013 https://www.boem.gov/newsroom/press-releases/boem-extends-public-comment-period-wind-energy-offshore-north-carolina.]. Stakeholders in this Project such as myself need more than a month and a half to fully comprehend over 1000 pages[Footnote 3: Public comment letter from Clean Ocean Action dated January 12 2024 posted by BOEM on January 22 2024 Comment ID BOEM-2024-0001-0007 calling on BOEM to extend the comment period to at least 45 days for the PEIS to review and comment on over 1000 pages of the PEIS.] of this PEIS including a highly technical Appendix [Footnote 4: BOEM Docket Number: BOEM-2024-0001 New York Bight Draft Programmatic Environmental Impact Statement January 2024 Volume II: Appendices A-O.] to retrieve the information in such a large document to make a fully reasoned response for such a complex Project comprising six lease areas in the NY Bight and the cumulative effects on the other regional BOEM lease areas and for BOEM to correct defects in the notice and mitigation analysis process.	
BOEM-2024-0001-0309-0010	In conclusion BOEM has granted many DEIS offshore wind comment extensions for projects less complex than this. An extension of the comment period by at least 45 days is a much more equitable period of time to correct for the lack of adequate notice and denial of due process rights accommodate a reasoned parsing of the magnitude of this novel Project of such size scope and complexity [Footnote 32: See Crain's New York Business January 25 2024 Caroline Spivack "What to know about New York's nascent offshore wind industry" https://www.crainsnewyork.com/climate/what-know-about-new-york-offshore-wind-industry; Crain's New York Business January 29 2024 Caroline Spivack "New York's Offshore Wind Industry Faces a Financial Reckoning" https://www.crainsnewyork.com/climate/new-yorks-offshore-wind-industry-faces-financial-reckoning.] and to fully comment on the PEIS. Considering the novel nature of the Project and large size of the DEIS its cumulative effects that are not discussed and their effects not mitigated as such in the PEIS as a stakeholder in this project I join numerous other stakeholders including local entities such as Defend Brigantine Beach Inc. and others in respectfully requesting additional time to comment.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. The purpose of the PEIS is to identify issues, analyze potential impacts, and identify potential AMMM measures for the six NY Bight lease areas. The analysis of the overall impacts of a full buildout of six projects in the NY Bight lease areas as part of Alternative B and Alternative C evaluated comprehensive cumulative impacts by examining offshore wind activities within the NY Bight area as a whole. Cumulative impacts for each resource were analyzed and are discussed in Section 3.

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BOEM-2024-0001-0313-0001	While the Town of Oyster Bay appreciates the consideration of our comments on the PEIS provided herein we would also like to reiterate the numerous requests to BOEM to date from various interested parties for an extension to the comment period deadline of at least 90 days. NEPA's implementing regulations provide that when an agency publishes a DEIS the public must be provided a minimum of forty-five (45) days to review and comment on the document. Given the unprecedented scope and magnitude of the proposed action the extremely voluminous and highly technical nature of this document clearly requires a reasonable amount of time to review and provide meaningful comments to BOEM. The public cannot be reasonably expected to complete this task within forty-five (45) days. NEPA is meant to provide the public with opportunities to meaningfully contribute to decisions that significantly affect the environment. To be meaningfully involved in this decision the public needs sufficient time to review and critically analyze the scientific and technical language within the Draft PEIS. Extending the public comment would allow the public to review and provide comments to BOEM that would serve to present critical local and intuitional knowledge to the experts. While it appears evident based on the response to questions and requests to BOEM to extend the comment period during the virtual hearing in an effort by BOEM to expedite the process it is short-sighted and problematic to sacrifice meaningful consideration of potential adverse impacts of this project in pursuit of expediting ultimate construction of the NY Bight project components. As stated by BOEM on the environmental assessment "BOEM is committed to facilitating robust public engagement in the offshore leasing process." (NY Bight EA page 9 of 167 as compared to the PEIS which is over 1200 pages for which an extension was granted). Providing adequate time for the public to engage in the environmental review process would be the only reasonable way to live up to that stated commitment.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0313-0012	There have been a number of recent reports on changes in ownership of offshore wind companies. For examples on November 30 2023 NYSERDA announced the launch of New York's fourth competitive offshore wind solicitation as part of New York's 10-Point Action Plan to bolster the State's growing large- scale renewable	BOEM’s leasing process for offshore wind is entirely independent of state goals and solicitations. BOEM is required to assess COPs as submitted by developers; its role is not to design projects to meet state goals.

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	industry. The expedited solicitation supports progress toward achieving New York's Climate Leadership and Community Protection Act (Climate Act) goals of sourcing 70% of New York's electricity from renewable sources by 2030 and developing 9000 megawatts of offshore wind by 2035. Information paraphrased below: On January 25 2024 NYSERDA received responses to New York's fourth offshore wind solicitation with six total bids for three projects from three offshore wind developers including Community Offshore Wind LLC with the Community Offshore Wind 2 project Empire Offshore Wind LLC with the Empire Wind 1 project and Sunrise Wind LLC with the Sunrise Wind project. On October 26 2023 NYSERDA issued a Request for Information to solicit public comment on proposed adjustments to this Request for Proposals including an expedited timeline and streamlined evaluation process. To allow for expedited preparation and review of proposal submissions submission requirements were significantly streamlined compared with ORECRFP22-1. ORECRFP23-1 provides flexibility for a variety of proposals including for projects that currently hold contracts with NYSERDA but commit to conditional termination. NYSERDA's updated policy regarding OREC agreement termination and contract security is detailed in Section 2.1.1.1 of the RFP which replaces and supersedes the policy that was published on November 16 2023.	
BOEM-2024-0001-0313-0016	Additionally in February 2024 the U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) prepared an Environmental Assessment (EA) to determine whether approval of additional site assessment activities as proposed by Beacon Wind LLC (Beacon Wind) within Lease Area OCS-A 0520 (Lease Area) offshore Massachusetts would lead to reasonably foreseeable significant impacts on the environment. Specifically On Feb. 1 2024 BOEM announced the publication of the Notice of Availability of a Draft Environmental Assessment (Draft EA) for Additional Site Assessment Activities on Beacon Wind LLC's Renewable Energy Lease OCS-A 0520 in the Federal Register on Feb. 2 2024. The publication opens a 30-day public comment period for the Draft EA which closes on Mar. 4 2024. Notice of Availability of a Draft Environmental Assessment (EA) for Additional Site Assessment Activities on Beacon Wind LLC's Renewable Energy Lease (Feb. 2 2024) Draft Environmental	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

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	Assessment for Additional Site Assessment Activities on Beacon Wind LLC's Renewable Energy Lease OCS-A 0520 (Feb. 2 2024) Another example is that On Nov. 21 2023 the Department of the Interior announced the approval of the construction and operation of the Empire Wind project offshore New York. Empire Wind US LLC proposes to develop two offshore wind facilities known as Empire Wind 1 and Empire Wind 2. The lease area is located about 12 nautical miles (nm) south of Long Island N.Y. and about 16.9 nm east of Long Branch N.J. Again additional relevant information paraphrased below for reference and context: The Record of Decision (ROD) documents the decision to approve the construction of 147 wind turbines within the lease area. Empire Wind ROD (Nov. 21 2023). Empire Wind Notice of Availability (Nov. 28 2023) The ROD represents the final step in the National Environmental Policy Act review process for the Empire Wind Construction and Operations Plan (COP). The lessee must still receive BOEM's final COP approval as required by its Renewable Energy Regulation and other required Federal and state authorizations. The COP approval represents the last major action by BOEM and is scheduled for Feb. 21 2024. As part of BOEM and BSEE's regulations the lessee cannot begin any construction on their lease until after review of the Facility Design Report and Fabrication and Installation Report (FDR/FIR). Location map provided for reference. SEE ORIGINAL COMMENT FOR MAP This is another reason why there is a necessity for a comment period extension BOEM has multiple voluminous documents with open comment periods for similar projects in various stages of review. The complexity of these projects and the interrelatedness are not being adequately disclosed and comprehensively evaluated. In an effort to expedite these processes the requisite comprehensive analysis is lacking and the changing parameters and segmented documents make it impossible to provide all- encompassing meaningful comments. By the time one comment period ends components in other environmental documents regarding other project components have changed or are not available for analysis and comment. Ultimately this defeats the purpose of providing these documents for public consumption analysis of cumulative impacts	

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	and ensuring the accuracy and validity of the environmental review process.	
BOEM-2024-0001-0313-0063	4.1 Unavoidable Adverse Impacts of the Proposed Action CEQ's NEPA-implementing regulations (40 CFR 1502.16(a)(2)) require that NEPA analyses evaluate the potential unavoidable adverse impacts associated with a Proposed Action. The Proposed Action is the adoption of AMMM measures (Alternative C) to reduce potential impacts of development of offshore wind in the NY Bight lease areas. SEE ORIGINAL COMMENT FOR TABLE 4.1.1: Potential unavoidable adverse impacts of the Proposed Action Comment Air quality and greenhouse gas emissions fails to consider the emissions from manufacturing processing and vehicular trips associated with the proposed project. Water quality consideration fails to include consideration of emerging contaminants and water quality degradation as a direct result of loss of filter feeding benthic organisms and submerged aquatic vegetation (SAV). The table also lacks the appropriate acknowledgement of the noise impacts and that would appear to be unavoidable even with mitigation measures as a result of the proposed action.	Chapter 4 presents a high-level description of unavoidable adverse impacts. Please see detailed analysis for air quality and GHGs in Section 3.4.1, for water quality in Section 3.4.2, and for noise with respect to marine mammals in Section 3.5.6. Appendix G, *Mitigation and Monitoring*, lists the AMMM measures (Table G-1) that have been previously applied as terms and conditions of COP approvals for COPs proposing offshore wind activities on the Atlantic OCS. BOEM will conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies during the COP-specific NEPA review.
BOEM-2024-0001-0313-0065	In summation the Town of Oyster supports environmentally sustainable practices that benefit the health and safety of this and future generations and preserve our suburban quality of life but there must be an abundance of transparency reasonable amount of time to thoroughly review and comment on all potential environmental impacts of all proposed actions. We appreciate the opportunity to provide comments and trust that BOEM will take our concerns into consideration. We look forward to ongoing communication on this matter and continued participation in the NEPA process.	Thank you for your comment. Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0314-0003	There are too many concerns including aesthetics and environmental damage to rush this project forward without further input from the public beyond this public comment period.	This PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lease holder is required to conduct project-specific environmental analyses through development and submittal of a COP, as required under 30 CFR 585.628. BOEM will conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing site- and project-specific analyses and will include additional public engagement during scoping and the draft EIS review.

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		Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA review for each lease area.
BOEM-2024-0001-0323-0001	I respectfully request a 180 day extension to have the opportunity to review this voluminous report which discusses issues which will have a grave impact on the ocean	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0331-0002	On request by the Bureau of Ocean Energy Management (BOEM) we have prepared and are providing the comments on the draft EIS (PEIS) herein. Relative to our understanding of the criteria in those statures and rules and other common-sense yardsticks the proposed project itself is extreme and unreasonable and the structure of the PEIS itself is not consistent with the recent NEPA rule changes of the Biden Administration. Beyond that as explained in detail herein from an environmental impact and public engagement perspective the manner in which this program is being implemented is a disgrace and makes a mockery of the NEPA and our other environmental statutes.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period and details of the public meetings held as part of the comment period.
BOEM-2024-0001-0331-0003	The amount of time available to review and comment on the PEIS is insufficient and we are formally requesting an extension of the public comment period by at least 90 days. The PEIS as 1420+ pages with approximately 100 references 15 appendices and nearly 180 tables nearly 85 figures and over 160 acronyms and abbreviations. The public meetings where not helpful in explaining any of the details of the content of the PEIS. At the very least there should have been classroom type seminars to review the contents of the PEIS so that the public has a better understanding of the subject matter.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0332-0001	First and foremost the deadline must be extended or better yet canceled altogether. The potential impacts that may result from the development of the six lease areas totaling 488000 acres offshore of the NJ and NY coastline offshore wind in the NY Bight are not well enough known and BOEM must to better to have a much better understanding of what's in jeopardy before rushing this through. So far every decision out from BOEM with regards to OSW has been approved. The speed of development is outpacing the speed of science and the needs of the sea. Top scientists are working in these topics and acknowledge vital data gaps with regards to potential	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. Section 3.6.1 of the PEIS, *Commercial Fisheries and For-Hire Recreational Fishing*, analyzed the impacts on recreational fishing and identified AMMM measures that could reduce impacts. Additional project-specific analysis of impacts on recreational fishing in each lease area will be completed as part of the COP-specific NEPA analyses required under 30 CFR 585.628. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures and identifies additional

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	impacts. Please see my attached letter in regards to massive issues with regards to recreational fishing. I urge BOEM to talk with and truly engage with the recreational fishing industry. It has been many years in this process and the recreational side of the industry has been largely left out and overlooked.	analysis that BOEM anticipates may be included in the COP-specific NEPA review for each lease area.
BOEM-2024-0001-0333-0004	We are satisfied with the efforts BOEM has made to engage the public and solicit comments from stakeholders. To those who complain that the comment period is too short we say that for almost two decades offshore wind energy development in the Mid-Atlantic has been covered in the media analyzed by scientists and engineers and evaluated by State and Federal agencies.	Thank you for your comment.
BOEM-2024-0001-0334-0001	Below are a number of important discussions submitted for consideration in the PEIS. I'll provide my summary and requests upfront for your convenience:- Please extend the review period.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0344-0001	Demanding 90 day extension to comment period for these massive documents to be reviewed.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0348-0001	The National Ocean Industries Association (NOIA) respectfully requests that the Bureau of Ocean Energy Management (BOEM) extend by 60 days the comment period for the Draft Programmatic Environmental Impact Statement (Draft PEIS) for Expected Wind Energy Development in the New York Bight (BOEM-2024-0001[Embedded Link: https://www.federalregister.gov/documents/2024/01/12/2024-00512/notice-of-availability-of-a-draft-programmatic-environmental-impact-statement-for-expected-wind]). The current deadline of the comment period February 26 2024 does not provide sufficient time to analyze the PEIS in the context of the involved lease areas (OCS-A 0537-0544) and to adequately respond.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0348-0002	We cordially request an extension of the comment deadline by 60 days through Friday April 26 2024. This extension would enable all stakeholders to engage meaningfully ensuring that we can provide well-informed and thoughtful feedback to enhance the effectiveness of the proposed rulemaking. Thank you for considering this request NOIA and its member companies are always available to answer any questions.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0354-0001	Also I have labeled these comments as "preliminary" with a reservation to submit other comments and materials in the event that BOEM does indeed grant my request to extend the official comment period at least ninety (90) days after the current due date of February 26 2024. POINT I I previously commented in a timely. manner with my request that BOEM extend the official time period for any and all comments submissions or expert reports for at the very least an additional ninety (90) day period. The aforesaid comments were given your official comment tracking number as lrt-dz9v-nxz7. To summarize the originally established forty-five (45) day comment period is woefully insufficient. The vast document itself is 1429 pages! There are not enough days or weeks to give even a cursory review to all of the materials presented. Similarly our town any professionals with whom we may desire to consult and the public in general deserve a reasonable time period to comment. The potential impacts of the proposal may cause irreversible impact if not harm to the Atlantic Ocean eco system commercial and recreational fisheries tourism along the Jersey Shore and our very way of life. As I had argued previously at the very least an additional ninety (90) daytime period is warranted so that thorough comments can be provided and some more in depth evaluations can be implemented.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0354-0002	I would again object to BOEM's artificial and arbitrary procedures being utilized with the scientifically unsupported consideration of such six (6) proposed lease sites in the New York Bight area being reviewed and commented upon in a vacuum and without consideration of all the vast numbers of other wind turbines proposed to be constructed off the New Jersey shore. As I referenced in my conversations with various BOEM officials at the February 8 2024 Toms River informational meeting I would ask BOEM to consider incorporating all the previously submitted comments on the record before BOEM as to the other environmental impact -statements with respect to wind turbine sites off the New Jersey/New York and _Mid-Atlantic coastline. Most importantly the focus of your review should include all such already existing records in a thorough interrelated process in full consideration of all th other New Jersey/New York and Mid-Atlantic	The purpose of the PEIS is to identify issues, analyze potential impacts, and identify potential AMMM measures for the six NY Bight lease areas. The analysis of the overall impacts of a full buildout of six projects in the NY Bight lease areas as part of Alternative B and Alternative C evaluated comprehensive cumulative impacts by examining offshore wind activities within the NY Bight area as a whole. Cumulative impacts for each resource were analyzed and are discussed in Section 3. Site-specific impacts from other projects in New Jersey, New York, and the Mid-Atlantic are outside the scope of the PEIS. Cumulative impacts from these projects will be addressed through the COP-specific NEPA analysis conducted for each lease area.

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	sites. As far ranging and large in scale as the currently proposed New York Bight project is in and of itself your current scope of review is inappropriately narrow and overly limited. As such the focus for review of the six (6) nearby combined lease sites for wind turbines is insufficiently comprehensive if not bureaucratically fabricated.	
BOEM-2024-0001-0354-0005	In particular I would argue it is arbitrary and capricious to fail to incorporate into the within Draft EIS record the entire record and all of the impacts the Atlantic Shores wind turbine project approved in close proximity to the very location of the six (6) combined lease sites currently under review.	Project-specific impacts from the Atlantic Shores project are outside the scope of this PEIS. Impacts from the Atlantic Shores project, including cumulative impacts, were addressed as part of the COP-specific NEPA analysis conducted for that project.
BOEM-2024-0001-0354-0018	POINT VII THE DEIS CONTAINS INSUFICIENT DATA AND LACK OF FULL DISCLOSURE OF ALL FUNDING SOURCES OF THE APPLICANT AND ANY GROUPS ASSOCIATED WITH THE APPLICANT WHO PROVIDED TESTIMONY. Any realistic calculations with a true cost benefit analysis of the project its funding and the cumulative and indirect impacts should include the full financial disclosure as to the project's applicants as well as the funding of all groups associated with the applicant who provided testimony. Transparency and full disclosure of all funding of the applicant is also necessary for any _realistic weighing process of alternative actions including a "no action alternative" to remain in place pending the implementation of a useful peer-reviewed pilot project. Similarly BOEM's duty to conduct even a basic credibility assessment as to the weight and value of the applicant's presentation requires such complex financial data and background. To render a determination as to the DEIS without such complete financial data and the full disclosure of all funding sources would be arbitrary and capricious.	The development of the PEIS was funded by the government (BOEM) and not an applicant. Financial disclosures related to the applicant and any group providing testimony as part of the public engagement process are outside the scope of this PEIS. In the PEIS, BOEM considered but dismissed from further consideration an alternative to build a pilot project (Chapter 2, Table 2-3). BOEM does not have the authority to prevent developers from submitting COPs and developing commercial-scale projects until after a pilot project is proposed and built.
BOEM-2024-0001-0356-0001	I am requesting a 90 extension to the public comment period. The EIS is over 1000 pages and the technical information contained within requires much more time for a quality review of such important information. Several important findings have come to light in recent weeks that need to be addressed.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0357-0004	We ask the BOEM to reconsider its process as it is the illogical and unreasonable decision making itself not necessarily the documents that are the root cause of the difficulties being encountered by the agency in the New Jersey and New York areas. The same can also be	BOEM is compliant with all regulations applicable to the NEPA process, including the required consultations under the ESA and the MMPA. Appendix A, *Consultation and Coordination*, details

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	said of the National Marine Fisheries Services and its decisions under the Endangered Species Act and the Marine Mammal Protection Act.	the ongoing coordination and formal consultation conducted for the PEIS.
BOEM-2024-0001-0357-0014	Consequences of a Full Impact Look Such an alternative project comparison would identify vast differences in the environmental impacts of different projects and is the only responsible way that the BOEM can implement a program in an environmentally responsible manner which Is its charge. In fact the BOEM does these comparisons internally when it selects lease areas. it should allow the public to engage in a similar process. This approach is described in more detail in Enclosure I.	The purpose of the PEIS is to identify issues, analyze potential impacts, and identify potential AMMM measures for the six lease areas by examining offshore wind activities within the NY Bight area as a whole. Additional project-specific analysis of impacts from projects proposed in each lease area will be completed as part of the COP-specific NEPA analyses required under 30 CFR 585.628. Section 1.2, Table 1-1, *History of BOEM planning and leasing activities in the NY Bight*, summarizes the history of BOEM's planning process and lease sale for the NY Bight, including details of the public notification and comment periods that were conducted as part of the process.
BOEM-2024-0001-0357-0023	Need to Engage Expert and other Public Input on Key Decisions. At no point in its decision making process does the BOEM allow for expert and other public input into its key decisions on turbine location number power and gear drive. The result has been some particularly uninformed and flawed decisions such as placing wind projects in the migration paths of critically endangered whales. The BOEM did is a Programmatic EIS review of alternative renewable energy technologies which although now dated supported its decision to move to offshore wind energy as it's renewable energy program. Now it leapfrogs to another so-called program EIS that considers project specific mitigation measures which have not even been demonstrated to be beneficially environmentally significant and to even rise to the level of an EIS review. But most importantly in between those two events it does not do any programmatic or other environmental review to support its most important decisions on turbine location turbine number turbine power and gear drive. Nor does it include those variables in its project EISs. It selfishly blocks the public from those key decisions and covets them for itself. Removing the public from those decisions is an abuse of its authority that needs to be corrected by expanding the scope of this program EIS or of the project EISs as presented above and allowing for public comment.	The evaluation of project-specific details in any of the NY Bight lease areas, such as turbine location number power and gear drive, are outside the scope of this PEIS. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include evaluation of the proposed wind turbine configuration. The NEPA process for each lease area's COP will include a public comment period during which the public can comment on any portion of the proposed project.

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BOEM-2024-0001-0362-0004	Are guided by robust and inclusive stakeholder engagement including labor organizations Tribal nations historically underrepresented or disadvantaged communities low-wealth communities of color and impacted ocean users.	Publication of the Draft PEIS initiated a 45-day comment period, which was extended in response to requests from Tribal Nations and other stakeholders. During the comment period, BOEM held five public meetings. Appendix A, *Consultation and Coordination*, summarizes coordination efforts with the public, Tribal Nations, and federal, state, and local agencies leading up to the preparation and publication of the PEIS. These efforts included formal consultations, cooperating and participating agency and Cooperating Tribal Government exchanges, the public scoping comment period, and other correspondence. Additional details can be found in Appendix I, *NHPA Section 106 Summary*.
BOEM-2024-0001-0362-0022	It should also include analysis of the benefits of community consultation related to adverse impacts and methods for continued community engagement around the oversight monitoring and structuring of mitigation plans including adaptive management strategies.	BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include evaluation of AMMM measures required for project implementation. Project-specific monitoring plans for each lease area will be developed by each lease holder in accordance with requirements of the COP-specific NEPA ROD and in consultation with the applicable regulatory agency. BOEM convened a series of quarterly environmental justice forums to offer a recurring space for participants to discuss topics related to environmental justice and offshore wind in the New York and New Jersey area. Topics of these meetings included potential impacts on environmental justice and underserved communities from offshore wind development, exploration of potential AMMM measures for environmental justice, discussions of approaches to improve the engagement process, and other topic areas identified by participants. Input received during these environmental justice forums was incorporated into the development of the Final PEIS.
BOEM-2024-0001-0362-0025	BOEM should analyze the extent of needed Tribal consultation. In line with the lease stipulations developers must ensure that all impacted Tribes are properly consulted including state-recognized Tribes and non-federally recognized Tribes in a geographic analysis area that is representative of their historical presence in the region. Robust consultation with Tribes should be extended to relevant activities that take place out of the state or region. Ensuring the	BOEM is committed to upholding its Tribal trust responsibilities and fostering working relationships based on trust and meaningful consultation. BOEM is continually working to improve the consultation process to engage Tribes and assist Tribal Nations expand capacity to engage in environmental reviews and NHPA Section 106 consultations.

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	consultation of Tribes and ensuring the preservation of cultural resources is critical for advancing the environmental justice goals set by the Biden- Harris administration.	Appendix I, Section I.1.2, *Consultation with Tribes and Consulting Parties and Public Involvement,* describes the activities BOEM has undertaken with regards to coordinating with federal, Tribal, state, and local government partners, particularly with regards to identifying cultural and historic properties. Appendix A, Section A.2.2, *Tribal Consultation,* describes the process for ongoing government-to-government consultation with federally recognized tribes.
BOEM-2024-0001-0366-0001	We the undersigned environmental justice organizations in New York and New Jersey are writing to formally request a 30-day extension of the comment period for the Draft New York Bight Programmatic Environmental Impact Statement (PEIS). We appreciate the Bureau of Ocean Energy Management's (BOEM) commitment to conducting a thorough and comprehensive environmental review. However the current comment period must provide adequate time for our organizations and communities to engage meaningfully. The Draft PEIS warrants careful consideration and thorough input from all stakeholders especially those disproportionately affected by environmental injustices. Extending the comment period will allow our organizations to better analyze the potential ecological social and economic consequences detailed in this 790-page document and provide more comprehensive and thoughtful feedback. We understand that the Draft PEIS covers a wide range of issues including but not limited to ecological impacts fisheries socioeconomic effects and environmental justice considerations. Given the complexity and significance of these topics an extension of the comment period is essential to ensure that the concerns and insights of our communities are adequately addressed.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0367-0001	I am writing on behalf of Ocean Conservancy to respectfully request a 15-day extension to the comment period for the Notice of Availability of a Draft Programmatic Environmental Impact Statement for expected wind energy development in the New York Bight. 89 Fed. Reg. 2249 (January 12 2024). This would extend the comment period to 60-days closing on March 12 2024. We are grateful for the steps the Bureau of Ocean Energy Management is taking to improve offshore wind permitting and recognize the importance of this Draft PEIS as well as the significant agency effort	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	put into its creation. Thus we want to ensure that we are able to give it the consideration and careful response that it is due. Because the issuance date of the Notice of Availability and the comment period overlapped with at least five other BOEM dockets related to offshore wind [Footnote 1: 88 FR 88107. Notice of Intent To Prepare a Programmatic Environmental Impact Statement for Future Floating Wind Energy Development Related to 2023 Leased Areas Offshore California. December 20 2023-February 20 2024.88 FR 86145. Atlantic Wind Lease Sale 10 for Commercial Leasing for Wind Power Development on the U.S. States Central Atlantic Outer Continental Shelf-Proposed Sale Notice. December 12 2023-February 12 2024.89 FR 2251. Notice of Availability of a Draft Environmental Assessment for Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Delaware Maryland and Virginia. January 12 2024-February 12 2024.89 FR 7409. Notice of Availability of a Draft Environmental Assessment for Additional Site Assessment Activities on Beacon Wind LLC's Renewable Energy Lease OCS-A 0520. February 2 2024-March 4 2024.89 FR 11313. Notice of Intent To Prepare an Environmental Assessment for Commercial Wind Leasing and Site Assessment Activities on the U.S. Outer Continental Shelf Offshore Oregon. February 14 2024- March 15 2024.] the extension would provide the time necessary for Ocean Conservancy and other stakeholders to be able to fully assess and provide comprehensive comment on the agency's Draft PEIS. As this docket represents the first opportunity for the public to provide feedback on a new application of programmatic NEPA for offshore wind which may be replicated in subsequent regions it is important that stakeholders get ample time to provide comprehensive feedback.	
BOEM-2024-0001-0369-0001	I'm writing on behalf of the National Wildlife Federation (NWF) and the broader eNGO community to respectfully request a 15-day extension to the comment period for the Notice of Availability of a Draft Programmatic Environmental Impact Statement (PEIS) for expected wind energy development in the New York Bight. 89 Fed. Reg. 2249 (January 12 2024). This would extend the comment period to 60- days closing on March 12 2024. Given that the issuance date of the Notice of Availability and the comment period overlapped	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

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	with at least five other BOEM dockets related to offshore wind [Footnote 1: 88 FR 88107. Notice of Intent To Prepare a Programmatic Environmental Impact Statement for Future Floating Wind Energy Development Related to 2023 Leased Areas Offshore California. December 20 2023-February 20 2024. 88 FR 86145. Atlantic Wind Lease Sale 10 for Commercial Leasing for Wind Power Development on the U.S. States Central Atlantic Outer Continental Shelf-Proposed Sale Notice. December 12 2023-February 12 2024. 89 FR 2251. Notice of Availability of a Draft Environmental Assessment for Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Delaware Maryland and Virginia. January 12 2024-February 12 2024. 89 FR 7409. Notice of Availability o' a Draft Environmental Assessment for Additional Site Assessment Activities on Beacon Wind LLC's Renewable Energy Lease OCS-A 0520. February 2 2024-March 4 2024. 89 FR 11313. Notice of Intent To Prepare an Environmental Assessment for Commercial Wind Leasing and Site Assessment Activities on the U.S. Outer Continental Shelf Offshore Oregon. February 14 2024- March 15 2024.] the extension would allow the time necessary for stakeholders to be able to fully assess the relevant documentation and comment on the agency's Draft PEIS. As this docket represents the first opportunity for the public to provide feedback on a new application of programmatic NEPA for offshore wind which may be replicated in subsequent regions it is important that stakeholders get ample time to provide comprehensive feedback.	
BOEM-2024-0001-0372-0001	I am writing to respectfully request a 15-day extension to the comment period for the Notice of Availability of a Draft Programmatic Environmental Impact Statement (PEIS) for expected wind energy development in the New York Bight. 89 Fed. Reg. 2249 (January 12 2024). This would extend the close date for the comment period to March 12 2024 as opposed to February 26 2024. Given the first-of-its-kind nature of the PEIS for the NY Bight TNC is determined to provide BOEM with its best recommendations and feedback to help shape BOEM's thinking on this important AMMM tool. A short extension would be appropriate and useful in increasing opportunity for the public to digest and comment on this document.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0381-0001	I would like to request a 90 day extension to the public comment period to review the draft PEIS. The vastness and speed of these projects is irresponsible at least.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0383-0001	Public Comment Period and Meetings: We request that BOEM refrain from continuing to issue overlapping public comment periods for offshore wind related actions. As small businesses that will be directly affected by the projects analyzed in this PEIS we do not have the bandwidth to participate in so many offshore wind public comment periods at one time especially when these comment periods overlap with Fisheries Management Council meetings. BOEM is aware of these conflicts as we have requested similar consideration before with no agency response. The NY Bight PEIS is an important action that we have not been able to meaningfully participate in due to the overload of offshore wind related meetings and overlapping comment periods. At the same time this PEIS was released for comment and public meetings being held BOEM released a Draft EA and only two public meetings for its Central Atlantic leases [Footnote 1: See https://www.boem.gov/renewable-energy/state-activities/central-atlantic.] a Draft EA and public meetings for Beacon Wind off the coast of MA [Footnote 2: See https://www.boem.gov/renewable-energy/state-activities/beacon-wind.] scheduled all of these during two simultaneous and related USCG Fairways comment periods- a Fairways Proposed Rule and Fairways PEIS- which were necessitated in part due to the NY Bight leases that this PEIS is analyzing [Footnote 3: See https://www.regulations.gov/document/USCG-2019-0279-0032 and https://www.regulations.gov/search?filter=USCG-2023-0928.] and all of these comment periods/meetings overlapped with both the New England Fishery Management Council meeting in New Hampshire and the Mid Atlantic Fishery Management Council meeting in Virginia. [Footnote 4: See January 2024 Council Meeting - Calendar - NEFMC and February 2024 Council Meeting Mid-Atlantic Fishery Management Council (mafmc.org).] BOEM did not hold any meetings concerning the NY Bight PEIS in Rhode Island despite the fact that the area is utilized by vessels from our state. It scheduled one of its only two virtual meeting options during the exact time and day of the only USCG Fairways PEIS	Please see response to comment BOEM-2024-0001-0002-0’01 regarding the duration and timing of the public comment period.

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	meeting in all of New England as well as simultaneously with the New England Fishery Management Council meeting in New Hampshire. This is an unacceptable level of conflict that precludes effective public participation from the commercial fishing community which is one of the primary affected entities by this action. The commercial fishing community is primarily small businesses which do not have the personnel to cover all these meetings at the same time much less read all the related documents at the same time. How does BOEM expect small businesses to effectively participate in multiple overlapping comment periods with overlapping meetings all requiring the reading of large documents for effective commenting in addition to conducting our regular business?	
BOEM-2024-0001-0392-0001	I'm very concerned about the impact of the wind turbines on marine life. Additional studies are needed especially a pilot project before this project begins. I'm asking for extension to the public comment period.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. In the PEIS, BOEM considered but dismissed from further consideration an alternative to build a pilot project (Chapter 2, Table 2-3). BOEM does not have the authority to prevent developers from submitting COPs and developing commercial-scale projects until after a pilot project is proposed and built.
BOEM-2024-0001-0397-0001	In the limited time TRI has had to review this voluminous PDEIS we can already see how the harms from direct impacts will lead to harmful secondary and cumulative impacts that are hemispheric and global in nature and should not be underestimated. In that light this proposal if allowed to move forward in its current form could well be putting our nation's biological and cultural diversity and our wild food and medicinal security at great risk. Since time does not allow TRI to elaborate in greater detail it is incumbent upon to us to request a 90-day extension on the public comment period. If our request is not granted please let the record reflect our calling on BOEM to adopt the No Action Alternative.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0403-0001	As mayor of the Borough of Point Pleasant Beach please accept this letter expressing strong opposition to the proposed impacts and alternatives outlined in the New York Bight Programmatic Environmental Impact Statement Docket No. BOEM-2024-0001.The process for public review of this document is inherently flawed. This highly technical document containing nearly 800 pages in Volume I alone is far too complex and nuanced for the general public to	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	review and synthesize within the 45 days permitted for public comment. While we are grateful for the opportunity for extended comment documents of this magnitude and impact truly require more than just 90 days.	
BOEM-2024-0001-0403-0003	Due to the massive impacts and geographical area of the six lease areas not only on the environment but on navigation/security commercial and recreational fishing tourism sea floor natural resources onshore transmission EMF emission etc. this New York Bight Programmatic Environmental Impact Statement should be retracted and revised with more accurate and meaningful data on a per-lease basis. At the very minimum the public comment period should be further extended to give the public a better chance to read and digest the information contained therein and to provide meaningful feedback.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. This PEIS will not result in the approval of any activities in the NY Bight lease areas. Each lease holder is required to conduct project-specific environmental analyses through the development and submittal of a COP, as required under 30 CFR 585.628. Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures and identifies additional analysis that BOEM anticipates may be included in the COP-specific NEPA analysis for each lease area.
BOEM-2024-0001-0417-0001	I am writing today to urge you to extend the public comment period on the New York Bight Draft Programmatic Environmental Impact Statement (Draft PEIS) by a minimum of ninety additional days. As you are aware the Draft PEIS encompasses a broader area than has ever been analyzed and the document being reviewed is over 1400 pages. Thus more time needs to be provided so that the public can review analyze and comment on such a comprehensive document. I have represented New Jersey coastal communities for many years and my constituents are very concerned with offshore wind development. We depend on the health of the ocean and beach for our tourism industry as well as quality of life. There needs to be adequate time to review this complex document and fully consider the region-wide effects of future offshore wind projects. Therefore I urge you to extend the public comment period by at least ninety additional days to May 26 2024. Providing this additional time serves the interest of good governance due process and transparency. Thank you for your attention to this critical matter and please feel free to contact me to further discuss this issue.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0419-0001	In the name of good governance due process fairness public interest and the democratic process we respectfully and urgently request that you extend the deadline for public comments on the New York Bight Draft Programmatic Environmental Impact Statement ("Draft	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	PEIS") by a minimum of ninety (90) additional days. The Draft PEIS encompasses a broader area than has ever been analyzed in a single National Environmental Policy Act ("NEPA") review document for the offshore wind industry. It is over 1400 pages including appendices with important information. Therefore it is unrealistic to expect the public to be able to meaningfully review analyze and comment on such a complex and comprehensive document within the minimum 45-day period; the comment period must be extended. The public has a heightened interest in offshore wind development especially in coastal localities in the New York Bight such as Ocean and Monmouth County beaches because we depend on the ocean's health to support commercial and recreational fishing as well as the tourism industry. The development of offshore wind projects in our region has been rapid especially relative to the state of the scientific study on the environmental effects of such widespread industrialization in the area. If approved the PEIS would speed up offshore wind development even further at the expense of site-specific study. Providing only the minimum public comment period is yet another example of BOEM unreasonably hastening the offshore wind development process.	
BOEM-2024-0001-0419-0002	Moreover there were delayed responses by BOEM to members of the public for paper copies of the necessary PEIS materials or details about the upcoming information sessions. This affected the ability to adequately prepare for public meetings and delayed the start of the review of the document. NEPA's implementing regulations provide that when an agency publishes a DEIS the public must be provided a minimum of forty-five (45) days to review and comment on the document. However BOEM is not limited to this time period which is wildly unrealistic and unjust in this instance given the unprecedented scope and highly technical nature of this document. BOEM has never before considered the region-wide effects of future offshore wind projects in a single environmental impact statement. As such it is critically important for commenters to analyze whether each detail in the Draft PEIS can reasonably be applied to all individual offshore wind projects in the area.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

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BOEM-2024-0001-0419-0003	The public cannot reasonably complete this task within forty-five (45) days. NEPA is meant to provide the public with opportunities to meaningfully contribute to decisions that significantly affect the environment. To be meaningfully involved in this decision the public needs sufficient time to review and critically analyze the scientific and technical language within the Draft PEIS. Citizen groups will be more able to share the labor of analyzing the Draft PEIS and drafting comprehensive comments but a consensus may be required to undertake and finalize comments which requires additional time. The public's written comments will be more helpful to BOEM if they can more comprehensively review the document conduct any necessary research and refine their comments after being informed at the public meetings. In closing extending the public comment period by at least ninety (90) additional days to May 26 2024 serves the interest of good governance due process and transparency. Please contact us if you have any questions.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0420-0001	On behalf of the Natural Resources Defense Council (NRDC) I am writing in support of the National Wildlife Federation's request for a 15-day extension to the comment period for the Notice of Availability of a Draft Programmatic Environmental Impact Statement (PEIS) for expected offshore wind energy development in the New York Bight. 89 Fed. Reg. 2249 (Jan. 12 2024). Please see the attached leter. Because the Draft PEIS comment period overlapped with at least five other BOEM dockets related to offshore wind an extension of the comment period would provide stakeholders and the public with the additional time needed to fully assess and provide thorough feedback on the Draft PEIS. This opportunity is especially important given that this docket represents the first opportunity to provide feedback on a new application of a programmatic NEPA analysis to offshore wind that may be repeated in other regions in the future. Thank you for your consideration of this request.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0450-0006	BOEM's Obligations Pursuant to the National Environmental Policy Act The National Environmental Policy Act (NEPA) one of the foundational U.S. environmental laws requires that BOEM consider "every significant aspect of environmental impact of a proposed action" as well as inform the public of its comprehensive	Thank you for your comment.

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	consideration of these concerns in the decision making process. [Footnote 5: Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council (NRDC) Inc. 462 U.S. 87 97 (1983) (internal citations and quotations omitted).] A well-crafted Environmental Impact Statement (EIS) including a PEIS should include an impact analysis that is comprehensive transparent objective and quantitative accounts for uncertainty and addresses data gaps considers reasonable alternatives and mitigation assesses cumulative impacts and requires monitoring and adaptive management. NEPA regulations allow for agencies to prepare a PEIS for actions such as the adoption of new programs and conduct the analysis on a variety of scopes including geographic. [Footnote 6: 40 C.F.R. 1502.4(b)(1).] Subsequent related NEPA reviews for individual projects or actions can reference the issues discussed in the broader document and tier off the PEIS. [Footnote 7: 40 CFR 1502.4; 1501.11.] It should be mentioned that the Council on Environmental Quality (CEQ) is currently considering regulations that would further encourage the use of PEIS's and tiering for geographic thematic or technological projects like offshore wind. [Footnote 8: 88 Fed. Reg. 49924 (July 31 2023).] Assuming these proposed regulations are promulgated they should lay an even clearer path for offshore wind projects to benefit from an early-in-the-process PEIS.	
BOEM-2024-0001-0450-0007	NEPA reviews shall be based on a purpose and need "to which the agency is responding in proposing the alternatives including the proposed action." [Footnote 9: 40 CFR 1502.13.] The purpose for this PEIS "is to identify issues analyze [the] degree of potential impacts and adopt as appropriate AMMM measures." [Footnote 10: Draft PEIS at ES-3.] Additionally "[t]he Proposed Action is needed to help BOEM make timely decisions on COPs submitted for the six NY Bight lease areas. Timely decisions further the United States policy to make Outer Continental Shelf (OCS) energy resources available for expeditious and orderly [offshore wind] development subject to environmental safeguards and other requirements including protection of the environment ..." [Footnote 11: Draft PEIS at ES-3.] Project-specific NEPA analysis for individual COPs which given the infancy of the U.S. offshore wind industry should be conducted via a EIS not an Environmental Assessment (EA) "will tier from or	Thank you for your comment.

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	incorporate by reference this PEIS and could apply additional or different AMMM measures as needed." [Footnote 12: Draft PEIS at ES-3.] The Draft PEIS lays out three alternatives: no action; an alternative B that "evaluates the impacts of (1) a single representative project developed in one NY Bight lease area without the application of any AMMM measures and (2) the overall impacts of a full build-out of six representative projects in the NY Bight lease areas without the application of any AMMM measures;" and an alternative C that is the Proposed Action which is "the adoption of AMMM measures such that the potential impacts described in Alternative B may be avoided reduced or mitigated." [Footnote 13: Draft PEIS at ES-6 9]	
BOEM-2024-0001-0532-0011	The Need for Coordination Related to Other Uses of the OCSThe Hudson Canyon the largest submarine canyon along the U.S. Atlantic coast is being considered for designation as a National Marine Sanctuary (NMS). The canyon serves as an important habitat for a variety of species of various conservation status including endangered sperm whales deep sea corals and sea turtles. [Footnote 31: National Oceanic and Atmospheric Administration (NOAA). "Hudson Canyon National Marine Sanctuary." NOAA Office of National Marine Sanctuaries. Accessed on February 25 2024. URL: https://sanctuaries.noaa.gov/hudson-canyon/] We urge a high degree of interagency and stakeholder coordination during both the sanctuary designation and offshore wind development processes to identify and mitigate any potential conflicts as early as possible. The National Oceanic and Atmospheric Administration (NOAA) which oversees the sanctuary designation process and BOEM which presides over the offshore development process should closely coordinate and facilitate communication with developers Tribal governments and other stakeholders.	Comment acknowledged. Avoidance of major OCS features was part of BOEM's planning process to identify lease areas (Section 1.2, Table 1-1, *History of BOEM planning and leasing activities in the NY Bight*), and none of the NY Bight lease areas are in the Hudson Canyon. Details of other uses of the OCS considered as part of the lease area identification are summarized in the *New York Bight Area Identification Memorandum Pursuant to 30 C.F.R. § 585.211(b)* (March 2021): https://www.boem.gov/sites/default/files/documents/renewable-energy/Memorandum%20for%20Area%20ID%20in%20the%20NY%20Bight.pdf.
BOEM-2024-0001-0452-0013	Prevention of Interference with Reasonable-Uses As noted above the AMMMs do not sufficiently mitigate impacts to commercial fisheries from offshore wind development in the NY Bight. In addition to NEPA offshore wind development is governed by the Outer Continental Shelf Lands Act which mandates that "the Secretary shall ensure that any activity under this subsection is carried out in a manner that provides for -(A) safety;(B) protection of the environment;...(D)	Appendix G, *Mitigation and Monitoring*, lists the AMMM measures for commercial fisheries. Most of the AMMM measures included in Appendix G have been previously applied as terms and conditions of COP approvals for COPs proposing offshore wind activities on the Atlantic OCS, while a smaller number of measures have not previously been required by BOEM as part of

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	conservation of the natural resources of the outer Continental Shelf;... and(I) prevention of interference with reasonable uses [Footnote 19: 43 U.S.C 1337(p)(4).]The PEIS was an opportunity to provide a comprehensive approach to environmental analysis and should have been leveraged to adhere to requirements to protect the environment natural resources and existing users. Unfortunately the AMMMs presented in the PEIS (in addition to the inappropriate timing after lease issuance) do not guarantee that the standards of OCSLA are met and ultimately minimizes the effectiveness of this programmatic analysis.	COP approvals. Table G-1 identifies these measures as "Previously Applied" and "Not Previously Applied." In addition, BOEM has identified measures in Table G-2 in Appendix G that are RPs for the offshore wind industry. BOEM encourages lessees to analyze and consider implementing these RPs, as they may further avoid and minimize impacts on resources, but BOEM will not require them as a condition of COP approval. BOEM will conduct project-specific NEPA analysis of the COP for each lease area that will focus on providing site- and project-specific analyses that were not already addressed by the PEIS. Project-specific alternatives will be considered by BOEM and cooperating agencies at the COP-specific NEPA stage.
BOEM-2024-0001-0468-0003	We believe the proposal will help projects to move more nimbly through the permitting process in compliance with state and federal laws which will facilitate construction of responsibly built offshore wind projects and allow this industry to reach its potential as a transformational solution to the intersecting environmental public health and economic crises of our time.	Thank you for your comment.
BOEM-2024-0001-0469-0001	BOEM held two virtual public meetings and three in-person meetings one each in New Jersey New York and Massachusetts. COA staff attended both virtual meetings and the in-person meeting in New Jersey. While COA appreciates that there was a mix of in-person and virtual formats there were several issues with the way in which these meetings were conducted which undermined the public engagement process. At the first virtual meeting participants were not told how much time they would be given to speak. The meeting facilitator gave three then two minutes then allowed three again [Footnote 1: N.Y. Bight Draft PEIS Virtual Meeting 1 Tr. at 5 17 (On page 3 of the transcript there is a typographical error saying the facilitator gave 2 minutes from the beginning. This does not match COA's notes or make sense considering how the facilitator justified switching to 2 minutes on page 5.)] causing participants who had prepared remarks longer than two minutes to spend the beginning of the presentation frantically cutting prepared statements and potentially missing important information from the presentation. COA raised this issue at the in-person meeting in New Jersey where BOEM staff assured	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

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	that commenters would be given three minutes at the next virtual public meeting. COA appreciates that BOEM honored that commitment. Going forward COA urges BOEM to include a time limit for oral testimony in the public notices and that a more reasonable time would be five minutes so participants can address the full scope and complexity of these issues. The value of virtual public meetings is not only to provide oral comments but also to hear other community members' testimonies and incorporate that information into more detailed written comments. However several of BOEM's choices made it practically impossible for participants to effectively use the information provided in the virtual meeting. For example the Question and Answer opportunity is of enormous value. COA and others submitted many substantive and detailed questions pertaining to the PEIS which BOEM staff answered at the end of the virtual hearing. Unfortunately unlike previous virtual hearings the questions submitted were not visible to the public. This decreases the quality and utility of the public's written comments. Further the closed-captioned transcripts were not downloadable so participants had to wait for BOEM to post the transcripts which took several weeks from the first virtual meeting. Agency representatives stated on the record that the transcripts would be available in two weeks; however as of February 23 2024 BOEM had not posted the transcripts of either virtual meeting. [Footnote 2: BUREAU OCEAN ENERGY MGMT. New York Bight https://www.boem.gov/renewable-energy/state-activities/new- york-bight (as seen Feb. 23 2024).] BOEM did eventually post the transcript around the same time that the agency granted a fifteen-day extension to the public comment period. [Footnote 3: Id. (as seen Mar. 1 2024).] The in-person meetings took an informal approach where members of the public could have one-on-one conversations with BOEM employees and contractors and ask them questions directly. COA highly values this opportunity as well. There were multiple stations covering a range of topics as well as representatives with general knowledge of the PEIS process however BOEM did not release a list of the topic areas that would be represented or the professional backgrounds of the BOEM representatives. According to BOEM staff the topics and representatives were chosen in advance of the public meeting but	

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	the public was not made aware of this decision. Indicating which topics were to be represented would have been helpful for the public in preparing questions in advance. Importantly at least at New Jersey's in-person meeting there was no opportunity to provide oral statements on the official record even though the registration form and the Federal Register notice indicated that participants would be able to record official oral comments. [Footnote 4: BOEM New York Bight Draft Programmatic Environmental Impact Statement (PEIS) In-Person Public Meeting https://docs.google.com/forms/d/e/1FAIpQLSdErZCABKuX0CXj-wEfJXofsgNO9qn-_1ETCn9ZNC9RY- sa3Q/view form (last visited Mar. 1 2024 (registration form for the in-person public meetings); Bur. Ocean Energy Mgmt. Notice of Availability of a Draft Programmatic Environmental Impact Statement for Expected Wind Energy Development in the New York Bight 88 FR 2249 2250 (Jan. 12 2024).] BOEM provided laptops and comment cards to submit written comments but there was no oral testimony taken despite BOEM promising that this was one of the functions of the in-person public meetings. There are benefits and drawbacks to both virtual and in-person forms of commenting and together they offer important opportunities for public engagement if done meaningfully. In-person comments are best for community members with low access to or familiarity with technology. Aside from accessibility issues oral and written comments serve different purposes especially when the opportunities for oral comment are given earlier in the review process and in the context of listening to other community members give their comments. COA held a Citizen Hearing on February 20 2024 to give community members an opportunity to make oral comments in a public setting and submitted the transcript as written comments on February 26. By no means does COA intend to discourage modernizing the way in which the agency conducts public outreach but the traditional oral testimony format is essential for good governance and due process. These issues in the timing and format of public engagement call into question the efficacy of BOEM's efforts to meaningfully engage with the public. BOEM should hold another round of public engagement activities before issuing	

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	the Final PEIS using what they have hopefully learned from this first instance of a PEIS process for OSW.	
BOEM-2024-0001-0474-0002	I submit the following comments to BOEM's Notice published on January 12 2024 with respect to the Draft PEIS and object to the intended action as arbitrary unreasonable fundamentally unfair and scientifically corrupt. ("Arbitrary"). Among other reasons the action is Arbitrary because the time submitted for public comment is insufficient for meaningful review and participation of stakeholders. The extension of fifteen (15) days for public comments was still not sufficient. Among other reasons the action is Arbitrary because the project area is referenced and named as the New York Bight thereby misrepresenting the impact on citizen stakeholders in New Jersey. Among other reasons the action is Arbitrary because the misnaming of the project area is chilling on the participation of citizen stakeholders in New Jersey and denies such citizens equal protection of the law. Among other reasons the action is Arbitrary because if the State of New Jersey is derelict in its duties to protect its own citizens the government actors on the federal level should step up rather than exploit the weakness of the New Jersey state government actors. Among other reasons the action is Arbitrary because the State of New Jersey references and applauds the actions of BOEM as its purported federal partner such that the federal participants are aware of the dereliction of duty by the State of New Jersey to the detriment of its citizen stakeholders. Among other reasons the action is Arbitrary because the purported public meetings were not scheduled and conducted for meaningful participation of citizen stakeholders. Among other reasons the action is Arbitrary because the format of a programmatic environmental impact statement review chills comment to the detriment of citizen stakeholders and to the benefit of offshore wind developers.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. The NY Bight is a geologic term used to describe the coastal embayment and offshore area that extends from Montauk Point on the eastern side of Long Island, New York, southwest to Cape May, New Jersey. BOEM did not name this geologic area, but uses “NY Bight” to describe the six lease areas analyzed in the PEIS.
BOEM-2024-0001-0505-0001	The public review and comment period is woefully and borderline criminally inadequate for a document and project of this magnitude. The public and impacted parties must be provided with sufficient time to review and study. In the interest of complete transparency and opportunity for public input about the project this comment period must be extended lest it appear there is something to hide.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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BOEM-2024-0001-0512-0004	It is very clear that there are still numerous unresolved issues surrounding the environmental economic and social impacts of these projects. Therefore I urge the Bureau of Ocean Energy Management to extend the comment period once again to allow for further public input and thorough consideration of the potential impacts of these projects.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0547-0001	As a Brigantine New Jersey homeowner and stakeholder I am writing to respectfully request a 180-day extension seeking more time to submit comments to the New York Bight Draft Programmatic Environmental Impact Statement ("PEIS") for the proposed project comprising six NY Bight lease areas ("the Project") offshore New Jersey and New York	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0547-0002	In addition I am writing to record my complete disapproval of the Project including lack of adequate notice in the PEIS process resulting in loss of due process for the stakeholders and affected environmental justice communities lack of adequate mitigation analysis (aka "AMMM Measures") failure to analyze "focused regional cumulative effects" [Footnote 1: BOEM PEIS Docket No. BOEM-2024-0001 ("PEIS") at ES-4.] and other violations of NEPA and respectfully request a decision of No Action.	Section ES.3 of the PEIS provides an overview of the public engagement process and activities to date. The publication of the Draft PEIS initiated a 45-day public comment period, which commenced with publication of the NOA of the Draft PEIS in the Federal Register on January 12, 2024. BOEM later extended the comment period based on requests from Tribal Nations and other stakeholders, which ended on March 13, 2024. Outreach included publication of the NOA in the Federal Register; BOEM press releases and social media announcements; email notifications to Tribal Nations, cooperating agencies, and consulting parties; and publication of legal notices in local newspapers to advertise the public comment period and solicit input on the Draft PEIS from the public and federal, Tribal, state, and local agencies. Additionally, BOEM conducted three in-person and two virtual meetings to inform interested attendees of the Draft PEIS and to provide the opportunity for the public to provide oral testimony.
BOEM-2024-0001-0547-0003	There is ample precedent for the Bureau of Ocean Energy Management ("BOEM") to extend the comment period for offshore wind projects such as this Project affecting offshore New Jersey and New York based on requests from the public for less complex projects than this NY Bight's six wind farm leases where time to comment was extended. For example BOEM has recently granted comment period extensions for the Sunrise and South Coast Wind projects among others[Footnote 2: Based on requests from the public on April 3 2023 BOEM announced a 15-day comment period	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.

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	extension for the DEIS for the proposed South Coast Wind (formerly Mayflower Wind) project offshore Massachusetts. https://www.boem.gov/newsroom/notes-stakeholders/comment-period-extended-southcoast-wind-draft-environmental-impact. On May 4 2022 BOEM announced the extension of the comment period by 10 days in response to stakeholder request regarding the Proposed Sale Pacific Wind Lease Sale 1. https://www.regulations.gov/document/BOEM-2022-0017-0001. BOEM extended the comment period to October 4 2021 for the Sunrise Wind project offshore New York. https://www.boem.gov/renewable-energy/state-activities/sunrise-wind#:~:text=On%20August%2031%2C%202021%2C%20BOEMand%20to%20make%20technical%20corrections. BOEM extended the comment period for the Call and the NOI for North Carolina's Offshore Wind Energy project originally published in the Federal Register on December 13 2012 for a 45-day comment period that ended on January 28 2013. Notices at the request of stakeholders seeking more time to submit comments were subsequently extended to March 7 2013 https://www.boem.gov/newsroom/press-releases/boem-extends-public-comment-period-wind-energy-offshore-north-carolina.]. Stakeholders in this Project such as myself need more than a month and a half to fully comprehend over 1000 pages [Footnote 3: Public comment letter from Clean Ocean Action dated January 12 2024 posted by BOEM on January 22 2024 Comment ID BOEM-2024-0001-0007 calling on BOEM to extend the comment period to at least 45 days for the PEIS to review and comment on over 1000 pages of the PEIS.] of this PEIS including a highly technical Appendix [Footnote 4: BOEM Docket Number: BOEM-2024-0001 New York Bight Draft Programmatic Environmental Impact Statement January 2024 Volume II: Appendices A-O.] to retrieve the information in such a large document to make a fully reasoned response for such a complex Project comprising six lease areas in the NY Bight and the cumulative effects on the other regional BOEM lease areas and for BOEM to correct defects in the notice and mitigation analysis process.	

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BOEM-2024-0001-0547-0011	Further I respectfully request No Action be taken on the Project due to the lack of adequate notice resulting in loss of due process lack of adequate mitigation in the PEIS as written and other violations of NEPA.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period.
BOEM-2024-0001-0547-0012	In conclusion BOEM has granted many DEIS offshore wind comment extensions for projects less complex than this. An extension of the comment period by at least 45 days is a much more equitable period of time to correct for the lack of adequate notice and denial of due process rights accommodate a reasoned parsing of the magnitude of this novel Project of such size scope and complexity [Footnote 32: See Crain's New York Business January 25 2024 Caroline Spivack "What to know about New York's nascent offshore wind industry" https://www.crainsnewyork.com/climate/what-know-about-new-york-offshore-wind-industry; Crain's New York Business January 29 2024 Caroline Spivack "New York's Offshore Wind Industry Faces a Financial Reckoning" https://www.crainsnewyork.com/climate/new-yorks-offshore-wind-industry-faces-financial-reckoning.] and to fully comment on the PEIS. Considering the novel nature of the Project and large size of the DEIS its cumulative effects that are not discussed and their effects not mitigated as such in the PEIS as a stakeholder in this project I join numerous other stakeholders including local entities such as Defend Brigantine Beach Inc. and others in respectfully requesting additional time to comment.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period. The purpose of the PEIS is to identify issues, analyze potential impacts, and identify potential AMMM measures for the six NY Bight lease areas. The analysis of the overall impacts of a full buildout of six projects in the NY Bight lease areas evaluated comprehensive cumulative impacts by examining offshore wind activities within the NY Bight area as a whole. Cumulative impacts for each resource were analyzed and are discussed in Chapter 3.
BOEM-2024-0001-0530a	My concerns have over the years - have been about this type of format for public participation. I believe that it's controlling the participants in the program – so - that you're reaching out to. When it comes to educating people on what the issues are, the public format is where someone can speak about their public concern, and other people in the audience can hear what that concern is. And then maybe they can also voice their concerns that build on that - that concern that's been presented. When you have a format like this, it's concentrated and really supports the development by not allowing true conversation of what the concerns are of the public. Right? So, more - more people involved is better, and hearing more people share information is better - for better - which will develop a better outcome. And this type of format here really restricts that type of sharing of	Please see response to comment BOEM-2024-0001-0002-0001 regarding the extension of the public comment period and details of the public meetings held as part of the comment period.

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	information and people cumulatively coming up with answers from BOEM, and where this kind of restricts that type of free-flowing of information. So, stop holding - meeting - public meetings like this. It's good to have people that can answer questions, but you really want to be able to have both formats. Right? You can do this in a separate room, but also have where people can come and testify about what their concerns are. That way there's a sharing of those concerns. And then maybe people would come next door as a group to find out the answers. But by restricting public comments like this, it's counterproductive and doesn't help BOEM being successful. Thank you.	
BOEM-2024-0001-0528d	COA reiterates our request for an extension of the public comment period by at least 90 days.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528d	While virtual and in person public meanings are appreciated, time will be needed to review and verify incorporate information learned into comments. With the comments due on February 26, BOEM gives people 13 days to review and respond to the information shared at today's meeting alone, and, as I said, the other, information has not even been posted yet. Most individuals do not even have the capacity due to proper review, despite their best efforts. Overall BOEM, provided the public with a mere 45 days to review a 1,400 page plus technical document. Finally, the area under review in the PEIS is enormous and unprecedented: totaling nearly half a million acres, which is about 2 thirds as big - I'm just summing up, thank you. In sum it is essential for the public to thoroughly review the draft PEIS for the protection of the ocean, among other reasons.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528l	I do echo the same concern about the limited time period for the public comment at 45 days. This is far too short for the public and any interested parties to fully digest and understand the impacts it contained in this PEIS. There's no, it's not a coincidence that this statement period or the public comment period is so short given the 2020 updates to regulations implementing the procedural provisions of the NEPA Act. This is quite clearly, intentionally done to limit public participation and feedback on these projects. In addition	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

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	those regulations also limit further PEIS or FEIS per project to is it 150 pages, or fewer or 300 pages, or fewer for more complex projects. This is completely unrealistic. The FEIS for Ocean Wind One was 2,300 pages alone. And now we're talking about 6 additional lease areas within the New York Bight that will have a real negligible and not negligible, real and and massive impact to the surrounding communities. Both for industry, national security, energy security, and people's quality of life quite frankly, as well as the environment that it seeks to protect and preserve. Again, please. I echo all of the the pleas from everyone who's commented today. We absolutely need more time to digest this sort of material. Without that time it seems sort of seems silly to even have these comment periods or these public meetings to begin with. So again, please consider extending this comment period. And with that. Thank you.	
BOEM-2024-0001-0528m	In opening comments it was mentioned that this process begins with public input. If that is the case, I like several other commenters, am requesting that the public comment period for this PEIS be extended. The most educated individual would find it difficult to review the 1,429 page document in 45 days, which breaks down to more than 31 pages per day.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528x	But first I'd like to request a 45-day extension in the comment period for the sheer scope of the document.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528z	We're moving too fast. I, too, support a longer comment period 45 days isn't enough.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528cc	This requires not just skimming the PEIS, but doing a sincere and diligent review. For this we need an extension, and therefore request a 90-day extension as we requested earlier in writing. Thank you so much.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528ee	So, I would like to request one an extension on the public comment period, along with more studies prior to construction of all these wind turbines.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period. BOEM’s Environmental Studies Program develops, funds, and manages rigorous scientific research specifically to establish

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		information needed for assessing and managing environmental impacts of energy and mineral development on the human, marine, and coastal environments. For more information on this program, visit https://www.boem.gov/environment/how-we-do-research. Further, BOEM's Office of Renewable Energy Programs depends on science to meet its responsibilities under environmental laws, regulations, and standards. As such, BOEM funds and manages scientific research to inform its decision-making processes for renewable energy projects on the OCS. For more information on Office of Renewable Energy Programs studies visit https://www.boem.gov/environment/environmental-studies/renewable-energy-research.
BOEM-2024-0001-0528ff	And we also agree with many on this call, Indigenous and non, who have said that the comment period is just too short. We recommend that an additional minimum of 90 days be extended to the comment period so that in these other organizations, other townships, other government - governmental pieces have the ability to go through this this documentation. You know, 2,400 pages, 1,700 pages. A lot of tribal organizations as well as community organizations that may be one person that that's working this project that has to represent their community. That that is just a tremendous load for one individual to then have to take and disseminate amongst their community to get feedback to make sure that they can make the proper comments that represent their community.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0528gg	I support the extension of more than even a 40-day comment period. Like someone had mentioned previously, there is not enough time to read all of these pages. We need more time.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0529s	COA requests an extension of the public comment period of at least 90 days, for the following reasons. One, BOEM provided the public with a mere 45 days to review a 1,400 plus page document with around 100 references, 15 appendices, nearly a hundred 80 tables, nearly 85 figures, and over a hundred 60 acronyms and abbreviations. This is an impossible amount of content for any one individual group to thoroughly review	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period. Section ES.3 of the PEIS provides an overview of the public engagement process and activities to date. The publication of the Draft PEIS initiated a 45-day public comment period, which commenced with publication of the NOA of the Draft PEIS in the

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	in a given time frame. Will take the average person hours and hours to review this document. Plus, due to the technical nature of the content, the time to carefully review, understand, evaluate, and verify, requires much longer. Then there's time needed to actually write the comments. Two, most individuals will not have the capacity to do the proper review, despite their best efforts, and will rely on interest groups, many of whom are volunteers with full-time jobs to review such a document. These groups often have, timeframes for approval and writing, that may exceed those 45 days. Three, COA is aware of public request of BOEM, for the EIS asking for paper copies and additional information about the upcoming public meetings that took longer than necessary. Clean Ocean Action received our paper copy of PEIS in the mail today. Four, the public meetings are appreciated, but more time will be needed to verify and incorporate lessons and information from the meetings into testimony and comments. Five, the subject area for the PEIS are areas labelled as the New York Bight, creating significant confusion for New Jerseyans, who are not clear if those, the PEIS applies to them and their interest. Six, there are several other obstruent projects and processes in the review process simultaneously, many of which should be considered in the PEIS itself.	Federal Register on January 12, 2024. BOEM later extended the comment period based on requests from Tribal Nations and other stakeholders, which ended on March 13, 2024. Outreach included publication of the NOA in the Federal Register; BOEM press releases and social media announcements; email notifications to Tribal Nations, cooperating agencies, and consulting parties; and publication of legal notices in local newspapers to advertise the public comment period and solicit input on the Draft PEIS from the public, Tribal Nations, and federal, state, and local agencies. Additionally, BOEM conducted three in-person and two virtual meetings to inform interested attendees of the Draft PEIS and to provide the opportunity for the public to provide oral testimony. BOEM provided hard copies of the Draft PEIS upon request, which were mailed via FedEx next day delivery. The New York Bight is a geologic term used to describe the coastal embayment and offshore area that extends from Montauk Point on the eastern side of Long Island, New York, southwest to Cape May, New Jersey. BOEM did not name this geologic area, but uses “New York Bight” to describe the six lease areas analyzed in the PEIS. BOEM is preparing this Final PEIS because of the close proximity of the six NY Bight lease areas; their similar level of development due to the leases being awarded from the same auction; the close timing of the anticipated COP submissions; and the high, near-term demand from the states of New York and New Jersey for electricity generated by offshore wind. Offshore wind activities, other than those expected in the six NY Bight lease areas, are considered as part of the cumulative analysis as either ongoing or planned offshore wind activities, depending on if there is an approved COP. These other offshore wind projects will also be considered again as part of the cumulative impact analysis at the COP NEPA stage.
BOEM-2024-0001-0529t	This perfectly illustrates why Clean Ocean Action submitted our request for a 90-day extension of the comment period on the first day it opened. BOEM has never considered the environmental effects of multiple over offshore wind projects at once in this way, so	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

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	it's crucial to evaluate every sentence, every appendix, and every reference.	
BOEM-2024-0001-0310a	So first and foremost, there must be an extension of this deadline.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310f	I urge BOEM to extend the public comment period another 90 days beyond the February 26th deadline.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310g	First, I ask that you extend the comment period and I ask BOEM that you listen to the comments and concerns of the citizens in this public hearing and all the written comments that you've gotten.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310h	First, I would like to demand a 90-day extension to the comment period due to the sheer size of the PEIS.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310j	Furthermore, it's ridiculous to allow only 45 days to review and comment on the 1429 pages of the Environmental Impact Statement for the six proposed offshore wind leases. I am requesting 90 more days for the public to review and comment.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0529dd	Thank you very much for letting me speak tonight. I will start off by saying that I did not know this, so I was on the Long Island Railroad, I had 5:39. So, you're letting people know about this event happening and marketing it, was not very well done.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period. Section ES.3 of the PEIS provides an overview of the public engagement process and activities to date. The publication of the Draft PEIS initiated a 45-day public comment period, which commenced with publication of the NOA of the Draft PEIS in the Federal Register on January 12, 2024. BOEM later extended the comment period based on requests from Tribal Nations and other stakeholders, which ended on March 13, 2024. Outreach included publication of the NOA in the Federal Register; BOEM press releases and social media announcements; email notifications to Tribal Nations, cooperating agencies, and consulting parties; and publication of legal notices in local newspapers to advertise the public comment period and solicit input on the Draft PEIS from the public, Tribal Nations, and federal, state, and local agencies. Additionally, BOEM conducted three in-person and two virtual

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		meetings to inform interested attendees of the Draft PEIS and to provide the opportunity for the public to provide oral testimony.
BOEM-2024-0001-0310o	I'm requesting an extension of the 45-day comment period.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310p	So I would like BOEM to extend that period where we can comment, because I'm a speed reader and I couldn't get through those 1500 pages. I need more time to digest this and come up with other comments and other questions. I would like you to be more transparent because I don't think you've been.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0529hh	I don't think it's fair, particularly the BOEM staff, that did all this work, that more time is not given to the public to be able to review the documents, both before comments are due, and before hearings like this are held.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310u	I know this isn't universally welcome, but gives us more time to read these thousands of pages of documents and their support documents so that we can provide. You say, you claim so kindly at these virtual hearings and these faces that you care and they really want to hear from the public. Well, if you really want to hear from the public give us a chance to validate all the things that you're claiming in these vast documents and do the homework that we need to do 'cause we know you're not doing your homework. So give us an opportunity.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.
BOEM-2024-0001-0310m	So I ask for an extension. Everybody is asking for an extension 90 days. How about you give us a year? How about you give us long enough until we can demonstrate to the public that you are not watching out for us. How about you give us long enough that we can prove that you're -- that the takes, that the killing of these dying animals are as a result of what you're allowing the builders to do? That could come.	Please see response to comment BOEM-2024-0001-0002-0001 regarding the duration, timing, and extension of the public comment period.

P.6 General Comment Summaries and Responses

P.6.1 Purpose and Need

Table P.6-1. General Comments on Purpose and Need

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter said that BOEM should avoid approving unnecessary projects while it performs the siting for future wind projects. Another commenter expressed concern that the weather conditions within the proposed site areas are becoming increasingly hostile to any offshore development, especially WTGs. The same commenter further wrote that high winds and hurricanes would lower the efficiency of the WTGs and may render the project cost ineffective.	Thank you for your comments. An analysis of the potential impacts of extreme weather events on WTGs in the NY Bight is included in Section 2.3, *Non-Routine Activities and Events*, of the PEIS. This PEIS will not approve any projects; the decision to approve, approve with modifications, or disapprove a COP will not occur until after COPs are submitted for the NY Bight lease areas and another level of NEPA analysis is completed.	**Submission IDs Contributing to Comment Summary:** BOEM-2024-0001-0353, BOEM-2024-0001-0402.
Comment Summary 2: A commenter expressed concern that offshore wind would be an unreliable energy source compared to nuclear or liquid natural gas because the energy produced cannot be stored. Similarly, another commenter said that the government should pursue long-term energy that is land-based before venturing into offshore energy production. A couple of commenters stated that offshore wind projects would need to be constructed to comply with New York State's Climate Leadership and Community Protection Act, which requires a certain percentage of electricity to come from sustainable sources.	Thank you for your comments. The consideration of other land-based renewable energy sources is outside BOEM's jurisdiction and the scope of this PEIS, which is to identify issues, analyze degree of potential impacts, and identify appropriate AMMM measures that may be applied to individual projects. Section 1.3, *Purpose and Need for the Proposed Action*, outlines the policy goals of the Biden Administration to combat the climate crisis and the States of New Jersey and New York's offshore wind energy generation goals.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0075, BOEM-2024-0001-0349, BOEM-2024-0001-0234, BOEM-2024-0001-0249.
Comment Summary 3: A commenter warned that development of offshore wind energy would reverse efforts to clean beaches and water along the Jersey Shore. A commenter expressed concern that development of offshore wind energy would only hurt citizens and wildlife. Another commenter wrote that there have not been enough studies or transparency of information regarding wind energy development. Similarly, a commenter stated that a responsible pilot project study of offshore wind	Thank you for your comments. Two offshore wind projects, CVOW – Pilot and Block Island Wind Farm, have been in operation on the Atlantic Coast for over 3 years and 7 years, respectively. These projects have acted as pilot projects for offshore wind development in the region. Studies conducted at these offshore wind sites to evaluate actual impacts of the development, operations, and maintenance of offshore wind infrastructure have been incorporated into this PEIS. The PEIS includes extensive evaluation of potential impacts	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0246, BOEM-2024-0001-0519, BOEM-2024-0001-0035; BOEM-2024-0001-0365.

Comment	Response	Submission IDs Contributing to Comment Summary
development should be conducted before proceeding with any proposed project.	of offshore wind development on a wide range of resource areas including coastal habitat, wildlife, and citizens. In addition, BOEM continues to engage in studies of the impacts of offshore wind development to inform future environmental reviews.	

P.6.2 Proposed Action and Alternatives

Table P.6-2. General Comments on the Proposed Action and Alternatives

Comment	Response	Submission IDs Contributing to Comment Summary
Alternative A		
Comment Summary 1: A commenter expressed support for adopting Alternative A, stating that money would be better spent on good paying jobs "mitigat[ing] abandoned mines, fossil fuel wells, and habitat degradation."	Thank you for your comment. BOEM is responsible for developing the nation's offshore resources and does not fund the construction or operations of offshore wind farms on the Atlantic OCS (including those that could occur in the NY Bight lease areas).	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0528.
Alternative C		
Comment Summary 1: Numerous commenters expressed general support for adopting Alternative C. Some of these commenters also asked BOEM to act quickly to finalize the proposed NY Bight projects.	Thank you for your comment.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0388, BOEM-2024-0001-0443, BOEM-2024-0001-0465, BOEM-2024-0001-0481, BOEM-2024-0001-0483, BOEM-2024-0001-0485, BOEM-2024-0001-0488, BOEM-2024-0001-0492, BOEM-2024-0001-0494, BOEM-2024-0001-0500, BOEM-2024-0001-0528.

Comment	Response	Submission IDs Contributing to Comment Summary
AMMM Measures		
Comment Summary 1: A commenter wrote that avoidance is the most important and most cost-effective mechanism for reducing impacts on migratory species. The commenter added that if large-scale renewable energy projects such as those proposed in the PEIS are likely to have impacts that cannot be fully mitigated, then those projects should not be pursued.	As stated in PEIS Section 1.4, BOEM's evaluation of wind energy development is governed by various applicable federal statutes and implementing regulations, which prescribe BOEM's responsibility for determining whether to approve, approve with modifications, or disapprove COPs submitted for lease areas within the NY Bight. BOEM's approvals for COPs on the Atlantic OCS have included numerous terms and conditions that avoid, minimize, and mitigate impacts on the physical and natural environment. The PEIS would not result in the approval of any activities, and BOEM would not approve any COP without adoption of mitigation measures.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0358.

P.6.3 Air Quality and Greenhouse Gases

Table P.6-3. General Comments on Air Quality and Greenhouse Gases

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: Many commenters expressed general support for transitioning away from fossil fuels and instead developing alternative renewable energy sources such as offshore wind. Some of these commenters also reasoned that wind energy projects would secure a clean energy-based future that protects the health of future generations of children. Numerous commenters likewise expressed support for BOEM's proposed Draft PEIS as a critical step toward achieving a 100-percent clean energy production. Some of these commenters also wrote that developing offshore wind energy could help address extreme weather events that have been worsened by climate change.	BOEM acknowledges and appreciates support for the PEIS.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0289, BOEM-2024-0001-0260, BOEM-2024-0001-0150, BOEM-2024-0001-0060, BOEM-2024-0001-0064, BOEM-2024-0001-0065, BOEM-2024-0001-0067, BOEM-2024-0001-0068, BOEM-2024-0001-0549, BOEM-2024-0001-0462, BOEM-2024-0001-0139, BOEM-2024-0001-0151, BOEM-2024-0001-0152, BOEM-2024-0001-0068,

Comment	Response	Submission IDs Contributing to Comment Summary
		BOEM-2024-0001-0486, BOEM-2024-0001-0557, BOEM-2024-0001-0364, BOEM-2024-0001-0497, BOEM-2024-0001-0258, BOEM-2024-0001-0414, BOEM-2024-0001-0455, BOEM-2024-0001-0130, BOEM-2024-0001-0102, BOEM-2024-0001-0059, BOEM-2024-0001-0351, BOEM-2024-0001-0253, BOEM-2024-0001-0430, BOEM-2024-0001-0460, BOEM-2024-0001-0155, BOEM-2024-0001-0068, BOEM-2024-0001-0489, BOEM-2024-0001-0104, BOEM-2024-0001-0156, BOEM-2024-0001-0554, BOEM-2024-0001-0528, BOEM-2024-0001-0088.
Comment Summary 2: Many commenters expressed support for the Draft PEIS, reasoning that wind energy development would reduce pollution in New Jersey and New York communities in addition to mitigating the worst effects of climate change. Several more commenters expressed support for wind energy development in New Jersey and New York, reasoning that fossil fuels are polluting the environment.	BOEM acknowledges and appreciates support for the PEIS.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0258, BOEM-2024-0001-0234, BOEM-2024-0001-0233, BOEM-2024-0001-0351, BOEM-2024-0001-0556, BOEM-2024-0001-0552, BOEM-2024-0001-0551, BOEM-2024-0001-0555, BOEM-2024-0001-0043, BOEM-2024-0001-0337, BOEM-2024-0001-0085, BOEM-2024-0001-0283,

Comment	Response	Submission IDs Contributing to Comment Summary
		BOEM-2024-0001-0196, BOEM-2024-0001-0179, BOEM-2024-0001-0501, BOEM-2024-0001-0103, BOEM-2024-0001-0321, BOEM-2024-0001-0066, BOEM-2024-0001-0057, BOEM-2024-0001-0237, BOEM-2024-0001-0353.
Comment Summary 3: A few commenters stated that the Northeast United States contains the nation's best offshore wind resources, such that it will have a unique advantage in reaping the economic and environmental benefits of offshore wind. Similarly, another few commenters wrote that wind energy projects can provide immediate and long-term benefits to public health and the environment. A few commenters stated that offshore wind energy development would help lower carbon emissions, promote sustainability, and reduce environmental impacts compared to current fossil fuel production. A few more commenters expressed concern that the effects of climate change could be exacerbated should BOEM take no action on the PEIS.	BOEM acknowledges and appreciates support for the PEIS.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0430, BOEM-2024-0001-0235, BOEM-2024-0001-0249, BOEM-2024-0001-0059, BOEM-2024-0001-0241, BOEM-2024-0001-0044, BOEM-2024-0001-0190, BOEM-2024-0001-0192, BOEM-2024-0001-0064, BOEM-2024-0001-0233.
Comment Summary 4: A few commenters wrote that developing wind energy production according to the PEIS would improve air quality by reducing air pollution. A couple of commenters wrote that, by reducing fossil fuel pollution, wind energy will help reduce the prevalence and severity of respiratory disorders, strokes, and asthma. Similarly, a commenter expressed support for investment in offshore wind, as it would help those who suffer from asthma, heart disease, and other medical conditions by improving air quality.	BOEM acknowledges and appreciates support for the PEIS. BOEM agrees that offshore wind energy (to the extent that the wind projects displace fossil fuels) would lead to reduced emissions of air pollutants, which could result in health benefits.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0353, BOEM-2024-0001-0235, BOEM-2024-0001-0550, BOEM-2024-0001-0554, BOEM-2024-0001-0145, BOEM-2024-0001-0125, BOEM-2024-0001-0298, BOEM-2024-0001-0215, BOEM-2024-0001-0258, BOEM-2024-0001-0556, BOEM-2024-0001-0555, BOEM-2024-0001-0235,

Comment	Response	Submission IDs Contributing to Comment Summary
		BOEM-2024-0001-0206, BOEM-2024-0001-0068, BOEM-2024-0001-0501, BOEM-2024-0001-0508, BOEM-2024-0001-0102, BOEM-2024-0001-0196, BOEM-2024-0001-0313.
Comment Summary 5: A commenter asked BOEM to stop polluting the land and oceans with green energy. Similarly, a commenter expressed concern that wind energy development would yield minimal energy output while polluting the ocean. A commenter expressed opposition to the PEIS, reasoning that providing green energy is not worth the cost to the economy, tourism, views, and sea life. A couple of commenters expressed concern that the development of wind energy projects would not provide environmental or energy benefits. A commenter warned that interrupting the flow of wind would increase warming on land and cause greater air pollution in populated areas. A commenter expressed opposition to WTGs due to their negative impacts on the environment, animals, and tourism.	Impacts on the economy are discussed in Section *3.6.3, Demographics, Employment and Economics.* Impacts on tourism are discussed in Section 3.6.8, *Recreation and Tourism.* Impacts on views are discussed in Section 3.6.9, *Scenic and Visual Resources.* Impacts on animals are discussed in the following sections: 3.5.1, *Bats;* 3.5.3*, Birds;* 3.5.5; *Finfish, Invertebrates, and Essential Fish Habitat;* 3.5.6, *Marine Mammals;* and 3.5.7, *Sea Turtles.* Impacts on climate and air quality are discussed in Section 3.4.1, *Air Quality*, and Appendix B.1, *Climate and Meteorology*.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0074, BOEM-2024-0001-0476, BOEM-2024-0001-0229, BOEM-2024-0001-0272, BOEM-2024-0001-0480, BOEM-2024-0001-0477, BOEM-2024-0001-0521, BOEM-2024-0001-0036.
Comment Summary 6: A commenter discussed statistics on methane leaks throughout the natural gas supply chain in the United States. The commenter reasoned that the no action alternative would increase the use of hydraulically fractured gas and should therefore mention the pollution from hydraulically fractured gas and refer to an estimate of the potentially resultant effects, such as health impacts.	Thank you for the comment.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0528.

P.6.4 Water Quality

Table P.6-4. General Comments on Water Quality

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter wrote that "sediment plumes created from wake effect" would cause irreversible damage to the water and its ability to sustain life. Similarly, a commenter stated that the glauconite, wake effect, and sediment plumes are all issues that would be affected by offshore wind projects. Another commenter said that sediment plumes originating from vibrations at the base of the WTGs would likely effect marine life and the marine food chain. Another commenter said that offshore wind development would lead to contamination of groundwater sources. A commenter said that fishermen continue to express concerns for the decrease in wind-driven coastal upwelling within the California current system by the extraction of energy from the winds responsible for the upwelling process, which results in high oceanic productivity.	Please see Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/intakes*, for the discussion of resuspension of contaminants; this section also indicates that a project-specific COP-level NEPA analysis will provide greater details of the specific NY Bight lease areas regarding sediment transport models and potential impacts. With respect to groundwater, at this programmatic stage the exact location of onshore components is not known; as such, potential impacts on groundwater sources will be included in a project-specific COP-level NEPA analysis. Section 3.4.2, *Water Quality*; Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*; and Section 3.5.2, *Benthic Resources*, provide analysis of hydrodynamic effects and the Mid-Atlantic Bight Cold Pool. This PEIS addresses offshore wind projects in the NY Bight, which will have no impact on the California current system.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0073, BOEM-2024-0001-0240, BOEM-2024-0001-0477, BOEM-2024-0001-0355, BOEM-2024-0001-0453.
Comment Summary 2: A commenter expressed concern that substations would use hundreds of gallons of ocean water to cool a facility while discharging billions of gallons of hot water into the ocean each day. Another commenter expressed concern that constructing thousands of offshore wind turbines would disrupt the North Atlantic current. Another commenter asked how the released water containing chlorine residuals would affect marine life.	Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*; and Section 3.5.2, *Benthic Resources*, provide analysis of entrainment and impingement, and Section 3.4.2, *Water Quality*, provides analysis of seawater intake and discharge from HVDC converter OSSs. Section 316(b) of the CWA requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impacts from impingement and entrainment of aquatic organisms. If a project is proposing open-loop systems, the project-specific COP-level NEPA analysis would analyze effects from the system, and additional mitigation may be proposed. Additionally, MUL-21 encourages the use of emerging technology, when possible, which may include using closed-loop cooling systems.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0365, BOEM-2024-0001-0504, BOEM-2024-0001-0528.

Comment	Response	Submission IDs Contributing to Comment Summary
	Section 3.4.2, *Water Quality*; Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*; and Section 3.5.2, *Benthic Resources*, also provide analysis of hydrodynamic effects and the Mid-Atlantic Bight Cold Pool.	

P.6.5 Bats

Table P.6-5. General Comments on Bats

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A couple of commenters said that WTGs pose a threat to birds and bats especially in areas with high avian activity. Collisions with turbine blades can lead to fatalities, raising concerns about the impact on local bird and bat populations.	Impacts on bats and birds, including collisions with turbine blades and mortality, are addressed in PEIS Sections 3.5.1 and 3.5.3, respectively.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0122-0005, BOEM-2024-0001-0355.

P.6.6 Benthic Resources

Table P.6-6. General Comments on Benthic Resources

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter wrote that the underground cables that would be used in offshore wind development would be encased in metallic tubing to prevent dangerous electrical leakage. The same commenter added that cables would only be linked to onshore power grids in remote or industrial areas, and not in residential areas, recreational areas, or ocean beaches. Conversely, another commenter expressed concern that the concrete used to support WTGs could contaminate the ocean floor. Another commenter said offshore wind projects will lead to the destruction of the seabeds and natural marine ecosystem.	RP MUL-4 proposes the use of several specific cable protection measures. RP MUL-39 proposes the electric shielding on underwater cables to control the intensity of EMF. Specific cable design and landing sites will be discussed in the project-specific COP. Section 3.5.2 acknowledges the impact on benthic resources and includes mitigation strategies.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0125, BOEM-2024-0001-0229, BOEM-2024-0001-0355.

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 2: A commenter expressed concern that benthic species in the lease areas could be harmed by numerous export cables crisscrossing throughout their habitat. Another commenter expressed similar concern that offshore wind projects could disturb the seabed where shellfish live.	RP MUL-23 proposes that developers adjust their project design to avoid or reduce potential impacts on important environmental resources. Interarray cable burial depth is expected to be between 3 and 9.8 feet (0.9–3 meters). Export cable burial depth is anticipated to be 3–19.6 feet (0.9–6 meters). For both interarray and export cables, 6 feet (1.8 meters) is the typical target burial depth. Depths may vary based on site-specific factors (e.g., soil type, cable/pipeline crossings, crossing of navigation channels or other federal civil work projects, other federal or state requirements). Armored cables will only be present in areas where burial is not possible. Some benthic species are expected to be temporarily affected during the construction phase of the project. Further discussion can be found in Sections 3.5.2 and 3.5.5.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0073.

P.6.7 Birds

Table P.6-7. General Comments on Birds

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A couple of commenters said that WTGs pose a threat to birds and bats especially in areas with high avian activity. Collisions with turbine blades can lead to fatalities, raising concerns about the impact on local bird and bat populations.	Impacts on bats and birds, including collisions with turbine blades and mortality, are addressed in PEIS Sections 3.5.1 and 3.5.3, respectively.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0122-0005, BOEM-2024-0001-0355.
Comment Summary 2: A commenter wrote that the potential negative impact on native bird populations would greatly outweigh any of the benefits of offshore wind development. Another commenter stated that the lease areas would be in the Atlantic flyway, which birds use for migration, such that offshore wind development could affect bird behavior, causing collisions, habitat disruption, altered flight patterns, and increased stress levels. A commenter expressed concern that offshore wind development could	As documented in PEIS Section 3.5.3, presence of birds in the offshore environment is low and, therefore, BOEM anticipates the risk to birds from offshore wind development and operations would be low. Potential collisions and disruption of behavior and flight patterns are addressed in PEIS Section 3.5.3. Potential impacts on federally listed threatened and endangered birds are addressed through the ESA Section 7 requirements. The New York Bight lease areas	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0244, BOEM-2024-0001-0463, BOEM-2024-0001-0358, BOEM-2024-0001-0240.

Comment	Response	Submission IDs Contributing to Comment Summary
endanger protected and native bird species. A commenter expressed concern that endangered birds rely on horseshoe crabs, whose spawning grounds in the lower Delaware Bay would be affected by development of the NY Bight projects.	are not in the Delaware Bay and BOEM has not proposed any future offshore wind development in the Delaware Bay.	
Comment Summary 3: A commenter stated that offshore wind development would place WTGs far enough offshore to avoid affecting coastal-dwelling or migrating birds. A couple of commenters wrote that climate disruption and habitat loss present a greater threat to birds than do WTGs, adding that newer turbines are designed to reduce bird strikes.	Thank you for the comment. As documented in PEIS Section 3.5.3, bird presence in the offshore environment is low. Climate change impacts on birds are also addressed in PEIS Section 3.5.3.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0125, BOEM-2024-0001-0258, BOEM-2024-0001-0351.

P.6.8 Coastal Habitat and Fauna

Table P.6-8. General Comments on Coastal Habitat and Fauna

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter expressed opposition to WTGs, saying that they negatively affect the environment.	See response to comment BOEM-2024-0001-0317-0009.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0036.

P.6.9 Finfish, Invertebrates, and Essential Fish Habitat

Table P.6-9. General Comments on Finfish, Invertebrates, and Essential Fish Habitat

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter expressed concern that the underground cables required for offshore wind farms would act like an electric fence to fluke, halibut, and other such species of fish. Additionally, a couple of commenters expressed similar concern that undersea cables would threaten sea crustaceans. Another couple of commenters warned that EMFs from offshore wind	An EMF analysis is provided in Sections 3.5.5.3.3 and 3.5.5.4.1. EMF exposure levels in the built environment are not expected to reach high enough energy levels to affect populations and there is no evidence to indicate that EMFs from undersea AC or DC power cables negatively affect commercially and recreationally important fish species (CSA Ocean Sciences Inc. and Exponent 2019; Gill and Desender	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0075, BOEM-2024-0001-0078, BOEM-2024-0001-0079, BOEM-2024-0001-0310, BOEM-2024-0001-0472,

Comment	Response	Submission IDs Contributing to Comment Summary
platforms will adversely affect sharks, skates, and electric eels, as well as the mating of flounder and other undersea habitats. Similarly, a commenter expressed concern that sound produced by offshore wind platforms could harm scallops, clams, mussels, crabs, lobster, and other such species. A commenter expressed concern that offshore cooling systems would be harmful to fish, shellfish larvae, and plankton. Another commenter wrote that scallop fishing would be affected by offshore wind development.	2020; NYSERDA 2017; SEER 2022; Taormina et al. 2018). An analysis of the potential impacts of sound is provided in Section 3.5.5.1.3. BOEM is analyzing several AMMM measures under Alternative C including measures to reduce dB levels using attenuation devices and shut-off protocols when animals are in the vicinity of sound sources. A discussion of the potential impacts of cooling system discharge and intake is provided in Section 3.5.5.3.3.	BOEM-2024-0001-0509, BOEM-2024-0001-0080, BOEM-2024-0001-0477, BOEM-2024-0001-0331, BOEM-2024-0001-0355.
Comment Summary 2: A commenter expressed concern that offshore wind projects would harm fish and other wildlife living in the lease areas. Another commenter wrote that wind farms should not be constructed on historical or extant fertile fishing beds. Conversely, a commenter stated that while sedentary or benthic ocean wildlife may be temporarily inconvenienced during construction, they will find adequate habitats among the artificial reefs created by the offshore wind platforms.	Thank you for your comments. The lease areas were selected after a thorough scoping process that included input from a diverse array of stakeholders (see https://www.boem.gov/sites/default/files/documents/renewable-energy/Memorandum%20for%20Area%20ID%20in%20the%20NY%20Bight.pdf and https://www.boem.gov/renewable-energy/state-activities/new-york-bight). Sites excluded through the initial scoping process did not meet BOEM's requirements. The Final Scoping Report is available in Appendix O. Extensive analysis and discussion of the impacts of construction and operation of the NY Bight projects are found in Section 3.5.5.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0207, BOEM-2024-0001-0076, BOEM-2024-0001-0125, BOEM-2024-0001-0181, BOEM-2024-0001-0344, BOEM-2024-0001-0345.

P.6.10 Marine Mammals

Table P.6-10. General Comments on Marine Mammals

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: Several commenters said that offshore WTGs negatively affect marine mammals and result in the take of marine mammals. A few commenters discussed the correlation between offshore wind activity and increased marine mammal deaths. A commenter said that NMFS, industry, and independent agencies need to address this correlation.	There is no causal connection between recent offshore wind development and large whale mortality, and such an assumption is contrary to the scientific consensus. The overwhelming scientific consensus is that offshore wind activity is not a cause of these marine mammal mortalities. Instead, the scientific community has determined the three declared UMEs for whales in 2016 and 2017 were primarily	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0038, BOEM-2024-0001-0075, BOEM-2024-0001-0097, BOEM-2024-0001-0240, BOEM-2024-0001-0247,

Comment	Response	Submission IDs Contributing to Comment Summary
	caused by non-wind vessel strikes and fishing gear entanglements (and infectious disease for minke whales). NOAA, the Marine Mammal Commission, academic institutions (e.g., Rutgers University, University of Rhode Island, Yale), environmental organizations (e.g., Sierra Club, Natural Resources Defense Council), BOEM, and the DOE have all issued official statements that no marine mammal mortality has been attributed to offshore wind activities.	BOEM-2024-0001-0244, BOEM-2024-0001-0244, BOEM-2024-0001-0250, BOEM-2024-0001-0272, BOEM-2024-0001-0305, BOEM-2024-0001-0358, BOEM-2024-0001-0399, BOEM-2024-0001-0418, BOEM-2024-0001-0434, BOEM-2024-0001-0457, BOEM-2024-0001-0476, BOEM-2024-0001-0477, BOEM-2024-0001-0480, BOEM-2024-0001-0509, BOEM-2024-0001-0078, BOEM-2024-0001-0079, BOEM-2024-0001-0089, BOEM-2024-0001-0262, BOEM-2024-0001-0331.
Comment Summary 2: A few commenters said that offshore WTGs do not result in the take of marine mammals. The commenters reasoned that the recent increases in marine mammal mortality are due to climate change and increased shipping traffic.	Thank you for your comments. BOEM agrees with this determination, as it is consistent with available scientific data regarding the recent whale strandings available to date.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0085, BOEM-2024-0001-0235, BOEM-2024-0001-0125.
Comment Summary 3: Citing a news article, a commenter asked how the leases would affect the endangered fin whale population, which the commenter stated live in the middle of all the lease areas.	A full discussion of the potential effects of offshore wind activities is included in the PEIS for all marine mammals, including fin whales; for IPFs that may have different effects on mysticete species (which include fin whales), this is specified in the impact determinations provided in the PEIS.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0236.
Comment Summary 4: Citing research, including maps of whale migratory patterns, a commenter discussed the importance of migratory animals such as whales. The commenter said that wind turbine activities could pose a threat to the phenomenon of migration.	The effects of WTG noise and presence of structures on whale migratory behavior are discussed in detail in Section 3.5.6.3.3 of the PEIS.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0358.

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 5: A couple of commenters expressed concern regarding how quickly wind development is moving forward and how little data there are on the potential impacts on marine mammals. A commenter said there needs to be more research done on the potential impacts of developing thousands of WTGs. A commenter stated that the proposed 1-year period to gather baseline data is unrealistic.	Thank you for your comment. BOEM will take your comment into consideration as it administers its program.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0528, BOEM-2024-0001-0528.

P.6.11 Commercial Fisheries and For-Hire Recreational Fishing

Table P.6-11. General Comments on Commercial Fisheries and For-Hire Recreational Fishing

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter expressed concern that constructing offshore WTGs would destroy recreational fishing from beaches and from boats. Similarly, another commenter wrote that the PEIS provides inadequate data on recreational fishing catch and effort as well as inadequate spatial data collected for recreational private boat anglers. The same commenter expressed additional concern that WTGs would act as offshore fish aggregating devices, which could greatly increase fish catchability around the WTGs, leading to localized and regional depletion that may harm recreational fishermen. The same commenter also warned that a significant portion of recreational fishing activity occurs within areas that have been leased for offshore wind development.	Section 3.6.1 discusses commercial fisheries and for-hire recreational fishing. Additional discussion of private recreational fishing from shore or personal vessels can be found in Section 3.6.8, *Recreation and Tourism*. The estimates of fishing pressure were obtained from NOAA's Marine Recreational Information Program, which is currently the best publicly available source of recreational fishing data. The analysis in Section 3.6.1 differentiates between the adverse and beneficial impacts on commercial and for-hire recreational fisheries including the reef effect of the WTGs. See the response to BOEM-2024-0001-0332-0004 regarding the location of recreational fishing activity within the lease areas.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0202, BOEM-2024-0001-0310.
Comment Summary 2: A few commenters expressed concern that scallop, oyster, and clam beds have already been negatively affected by survey activities, which has hurt local commercial fishermen. Another commenter wrote that the planned wind turbines could likewise displace the Mid-Atlantic based clamming industry, which would disrupt the commercial and recreational fishing industry. A commenter	Section 3.5.2.1.1 discusses the population decline of Atlantic surfclams in a 2016 Northeast Fisheries Science Center stock assessment using data from 2015, prior to any work within the area (NEFSC 2017). The NY Bight lease areas were designed to avoid certain commercial fishing activities based on stakeholder input and task force meetings held from 2017 to 2021. As described in Section 2.2, because the	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0504, BOEM-2024-0001-0240, BOEM-2024-0001-0463, BOEM-2024-0001-0517, BOEM-2024-0001-0320,

Comment	Response	Submission IDs Contributing to Comment Summary
warned that installation and operation of WTGs could disrupt traditional fishing grounds or alter the marine ecosystem, requiring fishermen to adjust their routes and affecting their catch. Additionally, the same commenter also wrote that the WTGs' foundations and underwater cables could create physical barriers to fishing activities and could likewise disrupt established fishing practices. Several more commenters expressed general concern that development of offshore wind farms in the NY Bight would have a significant negative effect on commercial fishing in the area.	locations of WTGs for the six lease areas are unknown, the PEIS analyzes a hypothetical project with the closest spacing possible for the WTG layout. The PEIS includes an RP that encourages lessees to propose consistent WTG layouts across adjacent lease areas as well as increased spacing as ways to reduce impacts. Lessees may propose greater spacing in their project-specific COPs to account for these concerns. See response to comment BOEM-2024-0001-0447-0004 regarding physical barriers and impacts on gear utilization. Further analyses of the impacts on the fishing industry from anticipated development in the six NY Bight lease areas are provided in Sections 3.6.1 and 3.6.3.	BOEM-2024-0001-0509, BOEM-2024-0001-0476, BOEM-2024-0001-0075, BOEM-2024-0001-0344, BOEM-2024-0001-0355.
Comment Summary 3: A commenter wrote that offshore wind farms can create artificial reefs that boost fish populations and thereby help sustain New Jersey's recreational and commercial fishermen. Another commenter wrote that offshore wind farms, with 90- to 150-foot clearances between a turbine blade's lowest point and the ocean's surface, would not threaten recreational boating or local commercial fishing.	Thank you for your comment.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0258, BOEM-2024-0001-0103, BOEM-2024-0001-0125.
Comment Summary 1: A few commenters expressed concerns regarding the disposal and decomposition of WTGs after their useful life and byproducts required during operations. A commenter asked whether fossil fuels are required to run WTGs.	Chapter 2 describes the requirements and typical process for decommissioning wind farms. The ultimate disposition of the WTGs will depend on demand for material, other available uses, and the technology at the time of decommissioning. Fossil fuels are not used to power WTGs, but oils and lubricants are required in the operation of WTGs.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0205, BOEM-2024-0001-0202, BOEM-2024-0001-0246, BOEM-2024-0001-0426.
Comment Summary 2: A commenter asked whether the maintenance costs would outweigh the benefits, including who would pay for the maintenance and how it would affect consumer electric bills.	Maintenance costs do not outweigh the benefits of offshore wind, as offshore wind will produce clean renewable energy and reduce the reliance on fossil fuel–produced power. Impacts on consumer electric bills would be variable, much as an electric bill is now. Depending on the amount of wind, the output of power may vary.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0246.

P.6.12 Demographics, Employment, and Economics

Table P.6-12. General Comments on Demographics, Employment, and Economics

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: Many commenters stated that offshore wind projects would benefit New York and New Jersey's economies by spurring development, increasing energy production, and improving energy security. Another couple of commenters added that offshore wind projects would also benefit local businesses and small communities. A couple of commenters also said that wind energy would provide an estimated $1.9 billion in state and local tax payments and land-lease payments every year. Additionally, a commenter said that new wind projects contributed $20 billion to the U.S. economy in 2021. Another commenter likewise wrote that the offshore wind industry could provide $25 billion to the economy by 2030. A commenter urged BOEM to continue "siting and building a steady stream" of offshore wind projects to maximize supply chain, port infrastructure, and workforce investments.	Thank you for your comment.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0145, BOEM-2024-0001-0104, BOEM-2024-0001-0103, BOEM-2024-0001-0430, BOEM-2024-0001-0351, BOEM-2024-0001-0190, BOEM-2024-0001-0192, BOEM-2024-0001-0162, BOEM-2024-0001-0059, BOEM-2024-0001-0085, BOEM-2024-0001-0258, BOEM-2024-0001-0158, BOEM-2024-0001-0102, BOEM-2024-0001-0150, BOEM-2024-0001-0462, BOEM-2024-0001-0528, BOEM-2024-0001-0088.
Comment Summary 2: Many commenters wrote that because wind is free, the cost of wind energy would be consistent once WTGs are built whereas fossil fuels remain subject to price swings. A couple of commenters similarly said that offshore wind projects would reduce energy costs and other related expenses. Conversely, several commenters expressed concern that offshore wind projects would cost taxpayers more money than they would save in energy use. Similarly, a commenter expressed opposition to offshore wind energy, reasoning that offshore wind projects would increase energy costs for coastal residents while decreasing property values, tourism, and jobs. A commenter likewise expressed concern that offshore wind would	The price of the power generated by the NY Bight projects will be determined by offtake agreements, also known as power purchase agreements, negotiated between the offshore wind companies and electric distribution companies, subject to each state's offshore wind procurement laws and regulations. The exact cost cannot be known at this time, as electricity rates are affected by myriad factors including current demand for electricity, the mix and price of other generation sources (e.g., other offshore wind projects, natural-gas power plants), and other factors, including natural events like high summertime temperatures. COP NEPA documents will be better able to conduct analyses concerning costs and rates when projects	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0104, BOEM-2024-0001-0497, BOEM-2024-0001-0235, BOEM-2024-0001-0154, BOEM-2024-0001-0429, BOEM-2024-0001-0153, BOEM-2024-0001-0138, BOEM-2024-0001-0102, BOEM-2024-0001-0059, BOEM-2024-0001-0125, BOEM-2024-0001-0457,

Comment	Response	Submission IDs Contributing to Comment Summary
increase electrical bills. Another commenter stated that the offshore wind industry remains in financial turmoil.	are defined and power purchase agreements are in place. Refer to response to comment BOEM-2024-0001-0357-0059.	BOEM-2024-0001-0477, BOEM-2024-0001-0097, BOEM-2024-0001-0244, BOEM-2024-0001-0390, BOEM-2024-0001-0310, BOEM-2024-0001-0240, BOEM-2024-0001-0036, BOEM-2024-0001-0526.
Comment Summary 3: Several commenters expressed support for offshore wind, reasoning that it would bring well-paying jobs in construction, manufacturing, and maintenance. Similarly, a couple of commenters said that offshore wind projects would create union jobs in coastal communities. Another commenter stated that wind turbine technician is the fastest growing job in the U.S., as it is projected to grow by 44% in the next decade. Similarly, a couple of commenters stated that the offshore wind industry could create at least 80,000 new jobs by 2030.	Thank you for your comment.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0364, BOEM-2024-0001-0257, BOEM-2024-0001-0145, BOEM-2024-0001-0103, BOEM-2024-0001-0430, BOEM-2024-0001-0351, BOEM-2024-0001-0258, BOEM-2024-0001-0234, BOEM-2024-0001-0162, BOEM-2024-0001-0070, BOEM-2024-0001-0104, BOEM-2024-0001-0059, BOEM-2024-0001-0102, BOEM-2024-0001-0150, BOEM-2024-0001-0528, BOEM-2024-0001-0523, BOEM-2024-0001-0526.
Comment Summary 4: A commenter opposed wind energy because offshore wind and commercial fisheries cannot coexist, and the project will result in thousands of jobs lost.	The six NY Bight lease areas were designed to avoid certain fishing activity based on stakeholder input and task force meetings held from 2017 to 2021. The Final Lease Sale Decision Memorandum explains that areas were removed from the leases to avoid conflict with fishing grounds. Section 3.6.1 provides a complete discussion of the existing fisheries, the potential impacts, and the AMMM measures that will minimize or mitigate potential impacts.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0176.

P.6.13 Environmental Justice

Table P.6-13. General Comments on Environmental Justice

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter wrote that environmental justice communities would be disproportionately burdened by the nearby presence of wind energy projects. Another commenter stated that Black, Indigenous, and other minority communities experience increased rates of cancer, asthma, and post-traumatic stress disorder from natural gas–related pollution. Similarly, several commenters said that communities of color often suffer disproportionately worse health impacts from pollution due to systemic racism and historically living closer to power plants. The same commenters added that investing in offshore wind would help these communities by reducing air pollution.	Thank you for your comment. The PEIS does not contain the specificity required to make determinations regarding disproportionate and adverse impacts on communities with environmental justice concerns, but location-specific impacts will be assessed by the COP-level NEPA documents. These NEPA documents will also be available for public comment. The application of AMMM measure EJ-1 (now EJ-1a in the Final PEIS), the Environmental Justice Communications Plan, could help minimize impacts on communities with environmental justice concerns. Benefits of offshore wind related to air emissions are included in the environmental justice analysis.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0044, BOEM-2024-0001-0235, BOEM-2024-0001-0385, BOEM-2024-0001-0508, BOEM-2024-0001-0553, BOEM-2024-0001-0145.

P.6.14 Navigation and Vessel Traffic

Table P.6-14. General Comments on Navigation and Vessel Traffic

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter warned that New York and New Jersey frequently experience strong storms and weather conditions including nor'easters, hurricanes, and tropical storms that pose navigational risks to ships. Another commenter expressed general concern that offshore wind development could present major navigational issues for ships including commercial and recreational vessels. Conversely, a commenter wrote that USCG has determined that offshore wind farms would not affect the three existing shipping lanes in the Ny Bight area.	Comprehensive regional vessel traffic surveys were conducted for this PEIS. Additional studies will be conducted for each site-specific EIS. The placement of all wind farm–associated structures will be based on the current guidance provided by the appropriate agencies, and each structure will be properly lit and charted. The use of prudent seamanship to ensure safe transit in the area of wind farm structures or any other navigational hazard is paramount.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0310, BOEM-2024-0001-0244, BOEM-2024-0001-0125.
Comment Summary 2: A commenter warned that offshore WTGs could interfere with navigational systems, preventing	The PEIS addresses the adverse impacts of WTG structures on radar in Section 3.6.7.4.1, *Radar Systems*. Please refer to	**Submission IDs contributing to comment summary:**

Comment	Response	Submission IDs Contributing to Comment Summary
larger ships from detecting smaller fishing, charter, and recreational vessels. Another commenter expressed similar concern that radar and navigational systems could be affected by offshore wind projects, reducing visibility. A commenter wrote that WTGs interfere with radar.	OU-1, OU-2, and OU-3 in Table 3.6.7-6 for radar mitigation measures.	BOEM-2024-0001-0247, BOEM-2024-0001-0504; BOEM-2024-0001-0509.
Comment Summary 3: A commenter asked several questions: • How does BOEM intend to address requirements of the Merchant Marine Act of 1920 (Jones Act) regarding the shipping of construction materials, O&M, and accessibility? • Were the American Maritime Officers Union, Seafarers International Union of North America, Marine Engineer Beneficial Association, Master Mates and Pilots, and Sandy Hook Pilots Association notified as part of the Jones Act? • Has BOEM addressed the accessibility of the lease areas with regard to ships?	Compliance with the Jones Act is the responsibility of the offshore wind developer that will be commissioning ships to support the construction and installation, O&M, and decommissioning of offshore wind farms. Comprehensive regional vessel traffic surveys were conducted for this PEIS. Additional studies will be conducted for each site-specific EIS. The placement of all wind farm–associated structures will be based on the current guidance provided by the appropriate agencies, and each structure will be properly lit and charted.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0222.

P.6.15 Other Uses (Marine Minerals, Military Use, Aviation, and Scientific Research and Surveys)

Table P.6-15. General Comments on Other Uses

Comment	Response	Submission IDs Contributing to Comment Summary
Military		
Comment Summary 1: A commenter warned that reliance on WTGs for electricity would present a national security threat.	In the unlikely event of a national security threat, coordination with USCG would provide clear instructions regarding procedures to be followed during emergency incident scenarios. The effects of a national security threat would depend on the magnitude and location of the attack; given the dispersed nature of the potential offshore facilities, it is unlikely that an attack would affect all offshore structures. Specific responses to such incidents will be discussed at the COP-specific NEPA EIS stage.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0229.

Comment	Response	Submission IDs Contributing to Comment Summary
	BOEM is continuing to work with the DoD and the Military Aviation and Installation Assurance Siting Clearinghouse to determine potential conflicts with DoD activities from impacts on military uses. Coordination with USCG is ongoing and will be continued at the COP-specific NEPA EIS stage. The PEIS addresses the adverse impacts of WTG structures on radar in Section 3.6.7.4.1, *Radar Systems*. Please refer to OU-3 in Table 3.6.7-6 for radar mitigation measures.	
Research Activities		
Comment Summary 1: A commenter said that more research is required about the effects on marine life resulting from sea floor mapping using sonar and radar before any proposed project can be built or operated.	Appendix C, *Tiering Guidance*, summarizes the affected environment, impact analysis, and AMMM measures discussed in this PEIS and identifies additional analysis that will be included in the COP-specific NEPA EIS analysis for each resource area, including surveys and research activities. Each lease area will undergo project-specific environmental analyses through the development and submittal of a SAP and a COP. BOEM will conduct project-specific NEPA analysis of the COP for each lease area, which will include detailed evaluation of impacts and will consider the best available data and information that reflect the state of the science at the time of publication.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0311.

P.6.16 Recreation and Tourism

Table P.6-16. General Comments on Recreation and Tourism

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter expressed concern that offshore wind development would adversely affect the pleasure boat industry. Another commenter likewise warned that installing WTGs off the coast could deter tourism. Conversely, another commenter wrote that the 90- to 150-foot clearances between a WTG blade's lowest point and the ocean's surface would prevent it from threatening recreational boating in its vicinity.	There are boaters who avoid offshore wind projects and there are new industries developing to take tourists to view the offshore WTGs. Offshore wind projects might be visible to some pleasure boaters. However, the closest lease area is over 20 nautical miles (37 kilometers) from shore, which is farther than most recreational boats travel. Interested boaters will be able to safely travel in areas near the WTGs.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0125, BOEM-2024-0001-0036.

P.6.17 Scenic and Visual Resources

Table P.6-17. General Comments om Scenic and Visual Resources

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: Several commenters expressed general concern that the proposed offshore wind projects could adversely affect the scenic view from the coastline. A commenter expressed concern with the proposed height of the WTGs would render the WTGs an "eyesore." Another commenter asked if the WTGs would be left in view if the facilities were shut down.	The visibility of the WTGs from coastal areas would be variable depending on meteorological, moonlight, and sunlight conditions. In views seaward from the shoreline there would be periods of high, moderate, low, and no visibility. Please refer to Section 3.6.9.4, *Impacts of Alternative B – Identification of AMMM Measures at the Programmatic Stage - Scenic and Visual Resources*, and *Appendix H, Seascape, Landscape, and Visual Impact Assessment*, for specific visual impact findings. The future COPs for individual leases and the associated EISs will address decommissioning WTGs.	BOEM-2024-0001-0477; BOEM-2024-0001-0463; BOEM-2024-0001-0457, BOEM-2024-0001-0168, BOEM-2024-0001-0250, BOEM-2024-0001-0311.
Comment Summary 2: A couple of commenters expressed support for visible offshore wind farms, reasoning that this would show that the government is addressing issues. Another commenter wrote that it would be beneficial to construct WTGs farther from land, so they are not visible from the shoreline.	Thank you for your comment. PEIS Section 3.6.9, *Scenic and Visual Resources*, concludes that the visibility of the WTGs from coastal areas would be variable depending on meteorological, moonlight, and sunlight conditions. In views seaward from the shoreline there would be periods of high, moderate, low, and no visibility. The six lease areas analyzed in the PEIS are between 20 nautical miles (37 kilometers) and 41 nautical miles (76 kilometers) offshore.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0231, BOEM-2024-0001-0234, BOEM-2024-0001-0382.

P.6.18 Cumulative Impacts

Table P.6-18. General Comments on Cumulative Impacts

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter expressed support for the cumulative impacts analysis included in Appendix D to the PEIS. Conversely, another commenter wrote that impact statements and mitigation reports cannot adequately describe the cumulative detrimental effects that the NY	Thank you for your comment. The CEQ NEPA Implementing Regulations require the impact analysis for NEPA documents to include cumulative effects, defined as the effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0192, BOEM-2024-0001-0498.

Comment	Response	Submission IDs Contributing to Comment Summary
Bight projects will have on the shorelines of New York, New Jersey, and Maryland.		

P.6.19 Programmatic Approach to Tiering

Table P.6-19. General Comments on Programmatic Tiering

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter expressed support for facilitating the timely approval of COPs. Similarly, a commenter urged BOEM to complete all the proposed wind energy projects in a timely fashion and asked BOEM to employ all possible environmental constraints. Another commenter asked BOEM to determine how it could streamline the permitting process for the proposed offshore wind projects in a way that would make these projects less expensive to build compared to offshore fossil fuel projects.	BOEM is committed to timely and complete review of each COP submitted by a developer. This PEIS was developed to assist in streamlining COP development and NEPA review for each lease area by identifying AMMM measures that BOEM may require as conditions of approval for activities proposed by lessees in COPs. Completing agency coordination and public engagement through this PEIS will allow lease holders to perform site investigations, data collection, and project design in the SAP and COP development phases that will streamline the NEPA review, agency consultation, and COP-approval processes.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0249, BOEM-2024-0001-0084, BOEM-2024-0001-0237.

P.6.20 National Environmental Policy Act/Public Involvement Process

Table P.6-20. General Comments on National Environmental Policy Act/Public Involvement Process

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: A commenter requested that BOEM extend the comment period by at least 90 days. Similarly, another commenter requested that BOEM extend the comment period to allow people to fully absorb the information in the PEIS. Another couple of commenters requested that BOEM extend the comment period without providing a specific timeframe.	Thank you for your comments. On February 29, 2024, BOEM announced that the comment period would be extended to March 13, 2024.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0223, BOEM-2024-0001-0240, BOEM-2024-0001-0310, BOEM-2024-0001-0445, BOEM-2024-0001-0528.
Comment Summary 2: A commenter expressed concern that BOEM would not provide extra time for the public to	Thank you for your comments. On February 29, 2024, BOEM announced that the comment period would be extended to	**Submission IDs contributing to comment summary:**

Comment	Response	Submission IDs Contributing to Comment Summary
read the Draft PEIS. Similarly, another commenter expressed concern that BOEM intends to follow through on the PEIS regardless of the public input provided. A couple of commenters expressed concern that BOEM has not conducted an adequate number of environmental impact studies to support the PEIS.	March 13, 2024. The Final PEIS has been revised to incorporate and address public comments as appropriate. This Final PEIS establishes a framework for subsequent environmental documents related to activities proposed by lessees in COPs for lease area–specific actions and identifies and analyzes possible AMMM measures to be used programmatically across the NY Bight lease areas. Where appropriate, analysis from previously completed environmental impact statements has been incorporated into the Final PEIS.	BOEM-2024-0001-0247, BOEM-2024-0001-0340, BOEM-2024-0001-0461-0069, BOEM-2024-0001-0548, BOEM-2024-0001-0432.
Comment Summary 3: A commenter requested an extension to the public comment period to allow for more time to conduct research on the potential impacts on marine life.	Thank you for your comments. On February 29, 2024, BOEM announced that the comment period would be extended to March 13, 2024.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0528.
Comment Summary 4: A commenter said that tribal cultural monitoring should be required for offshore wind and requested an extension to the comment period to allow for adequate tribal consultation.	Thank you for your comments. On February 29, 2024, BOEM announced that the comment period would be extended to March 13, 2024. Tribal consultation is ongoing. Monitoring requirements are included in the following cultural resources AMMM measures: CUL-3 and CUL-5.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0528.

P.6.21 General Support or Opposition

Table P.6-21. Responses to General Support or Opposition Comments

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 1: Some commenters expressed opposition to WTGs, reasoning that WTGs would negatively affect marine life, the seafloor, the fishing industry, tourism, and coastal property values. A few commenters stated that WTGs would not reduce pollution on a global scale and may result in the United States purchasing more oil from other countries. A few commenters expressed opposition to the use of taxpayer money for WTG development. A few commenters expressed concern over radar interference,	Thank you for your comments. BOEM acknowledges your opposition to offshore wind based on these concerns. Detailed comments were provided on many of these topics and have been addressed within those responses.	**Submission IDs contributing to comment summary**: BOEM-2024-0001-0009, BOEM-2024-0001-0014, BOEM-2024-0001-0022, BOEM-2024-0001-0028, BOEM-2024-0001-0034, BOEM-2024-0001-0071, BOEM-2024-0001-0077, BOEM-2024-0001-0081,

Comment	Response	Submission IDs Contributing to Comment Summary
defense capabilities, food security, and hurricane survivability.		BOEM-2024-0001-0090, BOEM-2024-0001-0097, BOEM-2024-0001-0099, BOEM-2024-0001-0098, BOEM-2024-0001-0100, BOEM-2024-0001-0143, BOEM-2024-0001-0165, BOEM-2024-0001-0170, BOEM-2024-0001-0172, BOEM-2024-0001-0177, BOEM-2024-0001-0178, BOEM-2024-0001-0200, BOEM-2024-0001-0209, BOEM-2024-0001-0224, BOEM-2024-0001-0309, BOEM-2024-0001-0381, BOEM-2024-0001-0453, BOEM-2024-0001-0474, BOEM-2024-0001-0514, BOEM-2024-0001-0528e, BOEM-2024-0001-0528u, BOEM-2024-0001-0528gg, BOEM-2024-0001-0529p, BOEM-2024-0001-0529q, BOEM-2024-0001-0310a, BOEM-2024-0001-0310d, BOEM-2024-0001-0310f, BOEM-2024-0001-0310i, BOEM-2024-0001-0310k, BOEM-2024-0001-0529bb, BOEM-2024-0001-0310n, BOEM-2024-0001-0310o, BOEM-2024-0001-0529ff, BOEM-2024-0001-0310r, BOEM-2024-0001-0529dd, BOEM-2024-0001-0529ii

Comment	Response	Submission IDs Contributing to Comment Summary
Comment Summary 2: Some commenters expressed support for WTGs, reasoning that WTGs would reduce pollution, mitigate climate change, create well-paying jobs, benefit environmental justice communities, and help achieve regional offshore wind goals and objectives. A few commenters expressed their support for the adoption of AMMM measures.	Thank you for your comments. BOEM acknowledges your support of offshore wind.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0015, BOEM-2024-0001-0048, BOEM-2024-0001-0050, BOEM-2024-0001-0058, BOEM-2024-0001-0061, BOEM-2024-0001-0062, BOEM-2024-0001-0065, BOEM-2024-0001-0069, BOEM-2024-0001-0085, BOEM-2024-0001-0092, BOEM-2024-0001-0094, BOEM-2024-0001-0135, BOEM-2024-0001-0144, BOEM-2024-0001-0150, BOEM-2024-0001-0160, BOEM-2024-0001-0164, BOEM-2024-0001-0166, BOEM-2024-0001-0206, BOEM-2024-0001-0211, BOEM-2024-0001-0468, BOEM-2024-0001-0496, BOEM-2024-0001-0506, BOEM-2024-0001-0525, BOEM-2024-0001-0528a, BOEM-2024-0001-0528b, BOEM-2024-0001-0528g, BOEM-2024-0001-0528i, BOEM-2024-0001-0528k, BOEM-2024-0001-0528n, BOEM-2024-0001-0528o, BOEM-2024-0001-0528p, BOEM-2024-0001-0528q, BOEM-2024-0001-0528s, BOEM-2024-0001-0528t,

Comment	Response	Submission IDs Contributing to Comment Summary
		BOEM-2024-0001-0529a, BOEM-2024-0001-0529b, BOEM-2024-0001-0529c, BOEM-2024-0001-0529d, BOEM-2024-0001-0529e, BOEM-2024-0001-0529g, BOEM-2024-0001-0529h, BOEM-2024-0001-0529i, BOEM-2024-0001-0529j, BOEM-2024-0001-0529l, BOEM-2024-0001-0529m, BOEM-2024-0001-0528dd, BOEM-2024-0001-0528hh, BOEM-2024-0001-0529r, BOEM-2024-0001-0529u, BOEM-2024-0001-0310e, BOEM-2024-0001-0529v, BOEM-2024-0001-0529w, BOEM-2024-0001-0529x, BOEM-2024-0001-0529y, BOEM-2024-0001-0529z, BOEM-2024-0001-0529aa, BOEM-2024-0001-0529ee, BOEM-2024-0001-0528v
Comment Summary 3: A commenter asked whether WTGs produce any heat that would affect the warming of ocean water.	Thank you for your comment. Information on potential heat generation associated with open-loop cooling systems is included in Section 3.4.2.3.2, *Cumulative Impacts of the No Action Alternative; Discharges/intakes.*	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0086.
Comment Summary 4: Multiple commenters expressed support for the PEIS because it would lower program costs by creating regulatory efficiencies and reducing redundancies and lessen burdens on communities and affected ocean users by identifying significant impacts earlier in project development.	Thank you for your comment.	**Submission IDs contributing to comment summary:** BOEM-2024-0001-0317, BOEM-2024-0001-0333, BOEM-2024-0001-0347, BOEM-2024-0001-0422, BOEM-2024-0001-0441.

P.7 Form Letters

Table P.7-1. Form Letter 1

Form Letter 1
I urge you to proceed with the offshore wind leases in the New York Bight. It is critical to center community engagement and prioritize the advancement of this project that will help reduce pollution, mitigate against the worst impacts of climate change, and bring family-sustaining jobs to the area. This project will lead to beneficial health outcomes while reducing air pollution, especially in communities of color that bear the brunt of emissions from fossil-fuel burning power plants and suffer disproportionate health impacts like asthma. Please commit to this project and reject efforts to slow it down or block it, so that New Jersey communities and the environment can be protected from harmful pollution and the worst effects of fossil- fuel driven climate change.
Response: BOEM acknowledges support for reduction of air quality impacts, climate change impacts, and positive economic impacts.
Number of Submissions associated with Form Letter 1: 512

Table P.7-2. Form Letter 2

Form Letter 2
The NY EIS should be discarded as submitteed. There are numerous instances where knowledge gaps exist that are dismissed as inconsequential to the project. Examples include gaps in knowledge of EMF emissions impacting benthic layers, and the authors suggest that ongoing studies taking place at Block Island Wind Farm, which has consistently operated at a fraction of its stated capacity, or not at all, should suffice as evidence that the project should forge ahead. This is IRRESPONSIBLE! Other problems include the referencing of work submitted by organizations that have benefitted directly from Orsted, such as Montclair State University, Woods Hole Oceanographic Institute and others. There are numerous insta where impacts that would result in most any commercial endeavor taking place in the ocean waters, in the case of this EIS for offshore wind, have been dismissed as negative or minimal impact. In the case of marine mammals this is at best irresponsible.
Response: BOEM has worked diligently to provide as much information as possible, under current regulatory guidance, using the best available data and information that reflect the state of the science at the time of publication of the EIS. More detailed and specific responses to the comments within this letter were addressed within Section P.5.6 *Benthic Resources* and Section P.5.10 *Marine Mammals*.
Number of Submissions associated with Form Letter 2: 2

Table P.7-3. Form Letter 3

Form Letter 3
The only way to protect and sustain our communities and our environment is the safe and responsible transition to 100 percent clean energy and the development of clean energy sources like offshore wind.
Response: BOEM acknowledges support for clean energy sources.
Number of Submissions associated with Form Letter 3: 2

Table P.7-4. Form Letter 4

Form Letter 4
Wind energy boosts U.S. economic growth and creates local union jobs. As wind energy grows, so do the positive economic impacts. In 2021, new wind projects added $20 billion to the country's economy. Wind turbine technician is the fastest growing job in the U.S. and is projected to grow by 44% in the next decade.
Response: BOEM acknowledges support for positive economic impacts.
Number of Submissions associated with Form Letter 4: 3

Table P.7-5. Form Letter 5

Form Letter 5
I support offshore wind development off the Jersey coast because a strong offshore wind industry will create thousands of well-paying union jobs. Transitioning to a clean energy future isn't just a win for the environment - it's a win for local businesses, the many union members who will be put to work and to New Jersey's overall economy. New Jersey's highly trained workforce is ready to step up to the plate and deliver clean, offshore wind to millions of families across our region. I commend BOEM for its efforts to support economic development so far and ask you to proceed quickly to ensure that New Jersey workers and communities see the benefits.
Response: BOEM acknowledges support for positive economic impacts.
Number of Submissions associated with Form Letter 5: 5

Table P.7-6. Form Letter 6

Form Letter 6
Climate & Environment • As we know all too well, the climate crisis poses an imminent threat to coastal communities and states across the entire Northeast. We've continued to experience inland flooding, sea level rise, severe rain, historic snowfalls, devastating hurricanes, and other extreme weather events, and as the climate crisis worsens, so will the weather. • To achieve the necessary carbon emission reductions to protect our communities from the climate crisis, we need a major transition in our energy sector now. The only way to protect and sustain our communities and our environment is the safe and responsible transition to 100 percent clean energy and the development of clean energy sources like offshore wind. • Wind energy is clean energy. Unlike energy from sources like coal or methane gas, wind energy does not require burning fossil fuels and does not release harmful, climate-destabilizing pollution. • By cutting our fossil fuel reliance, offshore wind will help alleviate the impacts of climate change statewide. Our communities have already faced the impacts of inland flooding, severe rain and weather events. This can go on no more. Jobs & Economy • Transitioning to a clean energy future isn't just a win for the environment — it's a win for local businesses, the many union members who will be put to work, and to New Jersey's overall economy. • The cost of wind energy is stable. Wind is free, so the cost of energy is consistent once wind energy installations are built. In contrast, fossil fuels are subject to volatile price swings and global events that create unwelcome surprises on energy bills. • Wind energy boosts U.S. economic growth and creates local union jobs. As wind energy grows, so do the positive economic impacts. In 2021, new wind projects added $20 billion to the country's economy. Wind turbine technician is the fastest growing job in the U.S. and is projected to grow by 44% in the next decade. • Wind energy supports local communities. Wind can power our homes and our way of life. Wind provides a stable source of tax revenue, delivering an estimated $1.9 billion in state and local tax payments and land-

Form Letter 6
lease payments every year. This is extra revenue that communities can put towards schools, reducing tax-burdens for homeowners, and boosting local infrastructure projects. <u>Health</u> • Production and combustion of fossil fuels releases dangerous pollutants into the air. These pollutants result in a wide range of health impacts including early death, heart attacks, respiratory disorders, stroke, and exacerbation of asthma. Communities of color often suffer a disproportionate burden of these health impacts due to systemic racism and historically living closer to power plants. • Investing in offshore wind won't just fight climate change, it will also help communities and urban residents breathe easier by lessening air pollution. • BOEM must act quickly to secure our clean energy future to protect the health of an entire generation of children.
Response: BOEM acknowledges support for a reduction impacts due to climate change, positive economic impact, and positive health outcomes.
Number of Submissions associated with Form Letter 6: 58

Table P.7-7. Form Letter 7

Form Letter 7
A recent report based on NOAA research confirms it: NJ is the fastest warming state in the country. And while extreme weather may be the most publicized impact of climate change, it's heat that kills the most people. We need to replace fossil fuels with renewable energy as soon as possible in order to protect the health and welfare of everyone who lives in New Jersey. I support offshore wind development because a transition to clean energy won't just fight climate change, it will also help improve the air New Jerseyans breathe. While our state's air has improved in recent decades, it still ranks among the worst in the nation. We need to invest in offshore wind to bring relief to people who suffer from asthma, heart disease and other medical conditions. The transition to cleanly produced offshore wind will bring particular benefits to those most at risk of heart and lung conditions: children and seniors. I'm calling on BOEM to act quickly to secure our clean energy future to protect the health of an entire generation of children.
Response: BOEM acknowledges support for clean energy sources.
Number of Submissions associated with Form Letter 7: 25

Table P.7-8. Form Letter 8

Form Letter 8
The construction of wind turbines in the New York Bight poses a significant threat to the marine ecosystem, particularly affecting numerous whale and fish species that frequent this area, as reported by Gotham Whales. This includes several endangered species, highlighting the critical nature of the threat. The use of sonar for seabed mapping in the region generates noise levels up to 226 decibels at the source, falling into the low-frequency range (LFI), which is within the hearing range of many whale and dolphin species. Analysis of NOAA data reveals a stronger correlation between the recent surge in whale mortalities and sonar mapping activities than with cargo ship traffic, challenging the notion that increased ship traffic is the primary cause of these deaths. Statistical evidence further supports this argument. From 2020 to 2021, despite an 18.46% increase in ship traffic, whale deaths astonishingly fell by 92.31 %. The following year saw a 25.15% rise in ship traffic, yet whale deaths still decreased by 53.85%. However, a pivotal shift occurred from 2022 to 2023; ship traffic declined by 18.56%, but whale deaths skyrocketed by 216.67%. This period coincides with a fourfold increase in surveying activities related to wind farm development, leading to an alarming spike in whale fatalities in the New York/New Jersey area. Specifically, 21 humpback whales perished, which, according to Gotham Whales' August 2022 count of 280 humpbacks in the region, represents a significant loss of 7 .5% of the population. Moreover,

Form Letter 8
NOAA's estimation that only one-third of whale deaths are detected suggests the actual impact could be even more devastating. These findings starkly contradict the argument that increased ship traffic is to blame for the rise in whale deaths. Instead, they implicate the intensification of surveying traffic, linked to wind farm development, as a significant factor. Given that a substantial 7.5% of the humpback whale population in this region was lost in a single year, and considering NOAA's admission that we may only be observing a fraction of the true number of fatalities, it's clear that the environmental implications of proceeding with wind turbine construction in this sensitive area are profound. This data mandates immediate, comprehensive research and a cautious approach by both the Bureau of Ocean Energy Management (BOEM) and NOAA before any further development is considered.
Response: More detailed and specific responses to comments within this letter were addressed within Section P.5.10 *Marine Mammals*.
Number of Submissions associated with Form Letter 8: 8

Table P.7-9. Form Letter 9

Form Letter 9
Climate & Environment As we know all too well, the climate crisis poses an imminent threat to coastal communities and states across the entire Northeast. We've continued to experience inland flooding, sea level rise, severe rain, historic snowfalls, devastating hurricanes, and other extreme weather events, and as the climate crisis worsens, so will the weather. To achieve the necessary carbon emission reductions to protect our communities from the climate crisis, we need a major transition in our energy sector now. The only way to protect and sustain our communities and our environment is the safe and responsible transition to 100 percent clean energy and the development of clean energy sources like offshore wind. Wind energy is clean energy. Unlike energy from sources like coal or methane gas, wind energy does not require burning fossil fuels and does not release harmful, climate-destabilizing pollution. By cutting our fossil fuel reliance, offshore wind will help alleviate the impacts of climate change statewide. Our communities have already faced the impacts of inland flooding, severe rain and weather events. This can go on no more. We support the NY Bight Projects! Thank you, BOEM.
Response: BOEM acknowledges support for a reduction impacts due to climate change.
Number of Submissions associated with Form Letter 9: 7

Table P.7-10. Form Letter 10

Form Letter 10
We support the NY Bight wind projects. We support Alternative C. Thank you!
Response: BOEM acknowledges your support for Alternative C.
Number of Submissions associated with Form Letter 10: 6

Table P.7-11. Form Letter 11

Form Letter 11
We support the NY Bight wind projects. Thank you!
Response: BOEM acknowledges your support for the New York Bight wind projects.
Number of Submissions associated with Form Letter 11: 34

Table P.7-12. Form Letter 12

Form Letter 12
Transitioning to a clean energy future isn't just a win for the environment- it's a win for local businesses, the many union members who will be put to work, and to New Jersey's overall economy. The cost of wind energy is stable. Wind is free, so the cost of energy is consistent once wind energy installations are built. In contrast, fossil fuels are subject to volatile price swings and global events that create unwelcome surprises on energy bills. Wind energy boosts U.S. economic growth and creates local union jobs. As wind energy grows, so do the positive economic impacts. In 2021, new wind projects added $20 billion to the country's economy. Wind turbine technician is the fastest growing job in the U.S. and is projected to grow by 44% in the next decade. Wind energy supports local communities. Wind can power our homes and our way of life. Wind provides a stable source of tax revenue, delivering an estimated $1.9 billion in state and local tax payments and land-lease payments every year. This is extra revenue that communities can put towards schools, reducing tax-burdens for homeowners, and boosting local infrastructure projects.
Response: BOEM acknowledges support for positive economic impacts.
Number of Submissions associated with Form Letter 12: 9

Table P.7-13. Form Letter 13

Form Letter 13
I am submitting these comments on behalf of 2,873 individuals who signed the following statement through the Sierra Club: I applaud the Biden administration's efforts to build 30 Gigawatts (GW) of offshore wind by 2030. Not only will responsibly sited and equitably developed offshore wind power help fight the climate crisis, but it will also allow us to create thousands of local, family-supporting jobs, as well as support cleaner, healthier, and more sustainable communities by transitioning off expensive fracked gas. Timely and thorough environmental review for the six offshore wind projects in the New York Bight will go a long way toward meeting the 30GW goal and fulfilling clean energy goals for New York, New Jersey and Massachusetts. Our region is already taking the lead with the first two commercial-scale offshore wind farms, Vineyard Wind 1 and South Fork Wind, in operation. We are poised to become a hub for offshore wind, and I encourage any steps to remove barriers while protecting our marine ecosystem and supporting robust, union jobs. To maximize the supply chain, port infrastructure, and workforce investments, we must continue siting and building a steady stream of projects. We have the solutions to fight the climate crisis and transition our country to 100% clean energy -- offshore wind must play a central role in that effort if we are to make this transition a reality. Attached to this submission, you will find the contact information of all 2,873 signers as well as personalized comments that 1,086 of the 2,873 signers wrote to this submission.
Response: BOEM acknowledges support for offshore wind projects.
Number of Submissions associated with Form Letter 13: 2,973

Table P.7-14. Form Letter 14

Form Letter 14
I support offshore wind development because the transition to clean energy is key to combating the systemic racism that has forced low-income communities and families of color to disproportionately bear the brunt of pollution for generations. Communities of color and low-wealth communities suffer higher rates of asthma, heart disease, and cancer because they are located close to power plants that burn dirty fossil fuels. Investing in offshore wind won't just fight climate change, it will also help people of color and urban residents breathe easier. I call on BOEM to do whatever it can to accelerate our transition to a clean energy future to protect the health and welfare of New Jersey's most vulnerable communities.
Response: BOEM acknowledges support for clean energy sources.
Number of Submissions associated with Form Letter 14: 166

P.8 List of Commenters by Commenter Type and Submission Number

Table P.8-1. Federal Agencies

Submission No.	Agency
BOEM-2024-0001-0342	MMC
BOEM-2024-0001-0370	U.S. Coast Guard
BOEM-2024-0001-0371	NOAA National Marine Fisheries Service
BOEM-2024-0001-0400	U.S. Fish and Wildlife Service
BOEM-2024-0001-0435	U.S. Environmental Protection Agency
BOEM-2024-0001-0466	National Park Service

Table P.8-2. Tribes and Native Organizations

None

Table P.8-3. State Agencies

Submission No.	Agency
BOEM-2024-0001-0317	NYS Agencies
BOEM-2024-0001-0319	Massachusetts Office of Coastal Zone Management
BOEM-2024-0001-0417	New Jersey General Assembly, Sean Kean
BOEM-2024-0001-0437	New Jersey Board of Public Utilities
BOEM-2024-0001-0448	NJDEP

Table P.8-4. Local Government/Agencies

Submission No.	Agency
BOEM-2024-0001-0313	Town of Oyster Bay, Department of Environmental Resources
BOEM-2024-0001-0444	New Bedford Port Authority

Table P.8-5. Elected Official

Submission No.	Agency
BOEM-2024-0001-0403	Doug Vitale
BOEM-2024-0001-0419	New Jersey State Legislature, James Holzapfel et al
BOEM-2024-0001-0421	New Jersey State Assembly
BOEM-2024-0001-0425	Mayor Peterson Borough of Seaside Park, Mayor John Peterson

Table P.8-6. Lessee

None

Table P.8-7. Businesses and Organizations

Submission No.	Agency
BOEM-2024-0001-0007	Clean Ocean Action
BOEM-2024-0001-0122	Bat Conservation International
BOEM-2024-0001-0181	ECOncrete
BOEM-2024-0001-0255	NJ Council of Divers and Clubs
BOEM-2024-0001-0259	Projects for Environmental Health, Knowledge, & Action, Inc.
BOEM-2024-0001-0322	The American Waterways Operators
BOEM-2024-0001-0324	North American Submarine Cable Association
BOEM-2024-0001-0331	Defend Brigantine Beach Inc., and Downbeach
BOEM-2024-0001-0333	New Jersey Environmental Lobby
BOEM-2024-0001-0345	Citizens Campaign for the Environment
BOEM-2024-0001-0346	Fisheries Survival Fund
BOEM-2024-0001-0347	American Saltwater Guides Association
BOEM-2024-0001-0348	National Ocean Industries Association
BOEM-2024-0001-0350	CFACT
BOEM-2024-0001-0352	Mid-Atlantic Fishery Management Council and New England Fishery Management Council
BOEM-2024-0001-0357	Save Long Beach Island, Inc
BOEM-2024-0001-0362	BlueGreen Alliance
BOEM-2024-0001-0366	New Jersey Environmental Justice Alliance, et al, Brooke Helmich
BOEM-2024-0001-0367	Ocean Conservancy
BOEM-2024-0001-0369	National Wildlife Federation
BOEM-2024-0001-0372	The Nature Conservancy
BOEM-2024-0001-0383	Seafreeze Shoreside and Seafreeze Ltd.
BOEM-2024-0001-0397	The Rewilding Institute
BOEM-2024-0001-0406	Community Offshore Wind
BOEM-2024-0001-0420	Natural Resources Defense Council (NRDC), Becca Loomis
BOEM-2024-0001-0422	Attentive Energy
BOEM-2024-0001-0423	Ocean Winds North America, LLC
BOEM-2024-0001-0426	Shoreline Energy Advisors
BOEM-2024-0001-0433	Sierra Club, NJ Chapter, Jackie Greger
BOEM-2024-0001-0436	Invenergy (Leading Light Wind)
BOEM-2024-0001-0438	PSEG Renewable Transmission LLC
BOEM-2024-0001-0439	American Clean Power
BOEM-2024-0001-0440	Shell New Energies US LLC
BOEM-2024-0001-0441	New Jersey Association of Women Business Owners (NJAWBO)
BOEM-2024-0001-0447	Garden State Seafood Assoc
BOEM-2024-0001-0450	National Wildlife Federation, Natural Resources Defense Council, National Audubon Society, et al.
BOEM-2024-0001-0451	Equinor Wind US LLC
BOEM-2024-0001-0452	Responsible Offshore Development Alliance
BOEM-2024-0001-0453	West Cost Pelagic Conservation Group
BOEM-2024-0001-0467	New York City Environmental Justice Alliance
BOEM-2024-0001-0468	NJ Work Environment Council

Submission No.	Agency
BOEM-2024-0001-0522	Greensmart, Inc., Roy Grimes

Table P.8-8. Individuals

Submission No.	Agency
BOEM-2024-0001-0002	A Z
BOEM-2024-0001-0304	AJ Caruso
BOEM-2024-0001-0512	AJ Conte
BOEM-2024-0001-0171	Alejandro Meseguer
BOEM-2024-0001-0547	Ann M. Zaneski
BOEM-2024-0001-0036	Anna Maksic
BOEM-2024-0001-0024	Anthony Blanco
BOEM-2024-0001-0101	April Miller
BOEM-2024-0001-0002	Ashley Donahue
BOEM-2024-0001-0505	Beverly Frantz
BOEM-2024-0001-0373	Bradley Krueger
BOEM-2024-0001-0040	Brendan Eccleston
BOEM-2024-0001-0004	Carl van Warmerdam
BOEM-2024-0001-0284	Carol Miller
BOEM-2024-0001-0176	Carrie Buchanan
BOEM-2024-0001-0282	Dan Thormann
BOEM-2024-0001-0478	Danielle Pla
BOEM-2024-0001-0017	Dennis and Margaret Nitkaa
BOEM-2024-0001-0169	Devin Waldron
BOEM-2024-0001-0003	Diane Snelson
BOEM-2024-0001-0025	Diane West
BOEM-2024-0001-0167	Donna VanCleve
BOEM-2024-0001-0381	Dorothy Westhead
BOEM-2024-0001-0334	Douglas Crawford
BOEM-2024-0001-0326	Drew Reindel
BOEM-2024-0001-0029	Edwin Barnes
BOEM-2024-0001-0045	Eileen Lowry
BOEM-2024-0001-0005	Elena Tillman
BOEM-2024-0001-0262	Elizabeth Gannon
BOEM-2024-0001-0010	Elizabeth king
BOEM-2024-0001-0046	Fred Akers
BOEM-2024-0001-0332	Gregory Cudnik
BOEM-2024-0001-0033	Heather Rafanello
BOEM-2024-0001-0023	Hunter Smith
BOEM-2024-0001-0011	Jacqueline Delario
BOEM-2024-0001-0019	James Dooley
BOEM-2024-0001-0041	Jeffrey Wald
BOEM-2024-0001-0105	Joan Reil
BOEM-2024-0001-0037	John A. Peterson, Jr.
BOEM-2024-0001-0089	John Nistad
BOEM-2024-0001-0354	John Peterson, Jr.
BOEM-2024-0001-0027	Judy Dye
BOEM-2024-0001-0523	Julie Leopold

Submission No.	Agency
BOEM-2024-0001-0039	K Federico
BOEM-2024-0001-0018	Karin Jervert
BOEM-2024-0001-0021	Katherine Cauley
BOEM-2024-0001-0020	Kathleen Merwin
BOEM-2024-0001-0071	Keith Uzzell
BOEM-2024-0001-0016	Kris Kraman
BOEM-2024-0001-0290	Lee Evans
BOEM-2024-0001-0323	Mary Haynes
BOEM-2024-0001-0516	Michael Dean
BOEM-2024-0001-0392	Michele Prestininzi
BOEM-2024-0001-0356	Michele Viventi
BOEM-2024-0001-0314	Nancy Difazio
BOEM-2024-0001-0030	Pat Digiacomo
BOEM-2024-0001-0225	Patricia Carniglia
BOEM-2024-0001-0013	Regina Littwin
BOEM-2024-0001-0180	Renee Waters
BOEM-2024-0001-0028	Richard Suer
BOEM-2024-0001-0217	Rob Gardella
BOEM-2024-0001-0355	Sherri Lilienfeld
BOEM-2024-0001-0368	Steve Ullmer
BOEM-2024-0001-0328	Sue Liebross
BOEM-2024-0001-0026	Susan DePalma
BOEM-2024-0001-0473	Sylvia Lockwood
BOEM-2024-0001-0063	Teresa Silletti
BOEM-2024-0001-0506	Theodore Chase Jr
BOEM-2024-0001-0031	Thomas Emerson
BOEM-2024-0001-0524	Trina Garrett

Table P.8-9. Anonymous

Submission No.	Agency
BOEM-2024-0001-0012	Anonymous
BOEM-2024-0001-0032	Anonymous
BOEM-2024-0001-0072	Anonymous
BOEM-2024-0001-0093	Franklin Township Environmental Commission Chair
BOEM-2024-0001-0242	Anonymous
BOEM-2024-0001-0308	Anonymous
BOEM-2024-0001-0344	Anonymous
BOEM-2024-0001-0394	WhoPoo App
BOEM-2024-0001-0395	Anonymous
BOEM-2024-0001-0408	Anonymous
BOEM-2024-0001-0442	Anonymous
BOEM-2024-0001-0474	Anonymous
BOEM-2024-0001-0479	Anonymous
BOEM-2024-0001-0482	Anonymous
BOEM-2024-0001-0487	Anonymous
BOEM-2024-0001-0493	Anonymous
BOEM-2024-0001-0495	Anonymous

Submission No.	Agency
BOEM-2024-0001-0496	Anonymous
BOEM-2024-0001-0514	Anonymous
BOEM-2024-0001-0525	Anonymous

Table P.8-10. February 13 Virtual Public Meeting Transcript (BOEM-2024-0001-0528)

Submission No.	Commenter
BOEM-2024-0001-0528a	Casey Petrashek
BOEM-2024-0001-0528b	Douglas Schmid
BOEM-2024-0001-0528c	Cindy Zipf
BOEM-2024-0001-0528d	Kari Martin
BOEM-2024-0001-0528e	Annie Licata
BOEM-2024-0001-0528f	Toni Groet
BOEM-2024-0001-0528g	Walter Korfmacher
BOEM-2024-0001-0528h	Meghan Lapp
BOEM-2024-0001-0528i	Drew Tompkins
BOEM-2024-0001-0528j	Walter Etter
BOEM-2024-0001-0528k	Anjuli Ramos
BOEM-2024-0001-0528l	Kristen O'Rourke
BOEM-2024-0001-0528m	Sylvia Lockwood
BOEM-2024-0001-0528n	Nivo Rovedo
BOEM-2024-0001-0528o	Dan Quinlan
BOEM-2024-0001-0528p	Chris Farschon
BOEM-2024-0001-0528q	Debra Coyle
BOEM-2024-0001-0528r	Heidi Yeh
BOEM-2024-0001-0528s	Jackie Greger
BOEM-2024-0001-0528t	Anthony Taddeo
BOEM-2024-0001-0528u	Carl van Warmerdam
BOEM-2024-0001-0528v	Jordan Christensen
BOEM-2024-0001-0528w	Erika Bosack
BOEM-2024-0001-0528x	Bonnie Brady
BOEM-2024-0001-0528y	Tricia Jedele
BOEM-2024-0001-0528z	Rose Willis
BOEM-2024-0001-0528aa	Mark Suer
BOEM-2024-0001-0528bb	Angel Garcia
BOEM-2024-0001-0528cc	Swarna Muthukrishnan
BOEM-2024-0001-0528dd	George Povall
BOEM-2024-0001-0528ee	Trisha DeVoe
BOEM-2024-0001-0528ff	Jason Hansana
BOEM-2024-0001-0528gg	Kathy Miklosey
BOEM-2024-0001-0528hh	Philip Falcone

Table P.8-11. January 31 Virtual Public Meeting Transcript (BOEM-2024-0001-0529)

Submission No.	Commenter
BOEM-2024-0001-0529a	Betsy Longendorfer
BOEM-2024-0001-0529b	Brian Russo
BOEM-2024-0001-0529c	Donna Criscuolo
BOEM-2024-0001-0529d	Sharonda Allen
BOEM-2024-0001-0529e	Peter Furcht
BOEM-2024-0001-0529f	Kathleen Harper
BOEM-2024-0001-0529g	Carolyn Rush
BOEM-2024-0001-0529h	Michael Skelly
BOEM-2024-0001-0529i	Ben Dziobek
BOEM-2024-0001-0529j	Hana Katz
BOEM-2024-0001-0529k	Cindy Zipf
BOEM-2024-0001-0529l	Steven Yafet
BOEM-2024-0001-0529m	Zach Boyer
BOEM-2024-0001-0529n	Rose Willis
BOEM-2024-0001-0529o	Toni Groet
BOEM-2024-0001-0529p	Annie Licata
BOEM-2024-0001-0529q	Carl Van Warmerdam
BOEM-2024-0001-0529r	Margaret Ortiz
BOEM-2024-0001-0529s	Kari Martin
BOEM-2024-0001-0529t	Erika Bosack
BOEM-2024-0001-0529u	Anthony Taddeo
BOEM-2024-0001-0529v	Heidi Yeh
BOEM-2024-0001-0529w	James Thompson
BOEM-2024-0001-0529x	David Case
BOEM-2024-0001-0529y	Cindy Moore
BOEM-2024-0001-0529z	Tanya Lobo
BOEM-2024-0001-0529aa	Ben Gilbarg
BOEM-2024-0001-0529bb	Leslie Mangold
BOEM-2024-0001-0529cc	Bonnie Brady
BOEM-2024-0001-0529dd	Kathleen Sullivan
BOEM-2024-0001-0529ee	Ellen Pedersen
BOEM-2024-0001-0529ff	Kathleen Miklosey
BOEM-2024-0001-0529gg	Adrienne Esposito
BOEM-2024-0001-0529hh	Mike Dean
BOEM-2024-0001-0529ii	Mike Jacobs
BOEM-2024-0001-0529jj	Christina Kramer
BOEM-2024-0001-0529kk	Shoshana Osofsky

Table P.8-12. February 8 In-Person Public Meeting Comments (BOEM-2024-0001-0530)

Submission No.	Commenter
BOEM-2024-0001-0530a	Brick Wenzel
BOEM-2024-0001-0530b	Greg Cudnik
BOEM-2024-0001-0530c	Gus Lovgren

Table P.8-13. February 20 Clean Ocean Action Meeting Transcript (BOEM-2024-0001-0310)

Submission No.	Commenter
BOEM-2024-0001-0310a	Jacqueline Walling
BOEM-2024-0001-0310b	Gregory Cudnik
BOEM-2024-0001-0310c	Jim Hutchinson, Jr.
BOEM-2024-0001-0310d	Vincent Lepore
BOEM-2024-0001-0310e	Phil Falcone
BOEM-2024-0001-0310f	Hara Rola
BOEM-2024-0001-0310g	Leslie Mangold
BOEM-2024-0001-0310h	Carrie Buchanan
BOEM-2024-0001-0310i	Barbara Skinner
BOEM-2024-0001-0310j	Trisha DeVoe
BOEM-2024-0001-0310k	Maureen Schmid
BOEM-2024-0001-0310l	Lisa Daidone
BOEM-2024-0001-0310m	Douglas Crawford
BOEM-2024-0001-0310n	Gus Lovgren
BOEM-2024-0001-0310o	Rose Willis
BOEM-2024-0001-0310p	Patricia Brennan
BOEM-2024-0001-0310q	Richard Jones
BOEM-2024-0001-0310r	Jamie Steiert
BOEM-2024-0001-0310s	Mark Suer
BOEM-2024-0001-0310t	Stephanie Adams
BOEM-2024-0001-0310u	Cindy Zipf

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P.9.2.1 Section P.5.1, Purpose and Need

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